THE

THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A MONTHLY JOURNAL

OF

Practical Therapeutics

EDITED BY

H. A. HARE, M.D.,

Professor of Therapeutics and Diagnosis in the Jefferson Medical College,

GENERAL THERAPEUTICS;

AND

EDWARD MARTIN, M.D.,

Formerly Professor of Surgery in the University of Pennsylvania,

SURGICAL AND GENITO-URINARY THERAPEUTICS.

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ORIGINAL COMMUNICATIONS.

ELECTROCARDIOGRAPHY IN DIAGNOSIS AND TREATMENT.[1]

BY ROSS V. PATTERSON, M.D.,

Associate Professor of Medicine, Jefferson Medical College, Philadelphia.

The purpose of this paper is to formulate a brief outline of the present status of electrocardiography, and to present a temperate estimate of its clinical value in the diagnosis and treatment of cardiac conditions. The scope of discussion thus restricted does not contemplate the usual historical review of the origin and development of the science, a description of the apparatus employed, an exposition of the underlying physical and physiological principles, or the interpretation to be placed upon variations in the character and relations exhibited by the different electrical wave curves obtained by the method.

No attempt will here be made to offer anything new to those intimately familiar with electrocardiography. On the contrary, I shall endeavor to present only that which has been established and accepted by technical workers, tested and tinctured in a considerable personal experience with the science applied to the routine problems presented by cardiac patients in hospital and private practice.

It is, perhaps, unnecessary to draw attention to the very great importance of cardiac disease as revealed in both mortality statistics and morbidity estimates. The mortality tables of the death-registration area in continental United States for 1917 present an analysis of 1,068,932 deaths, nearly one-third of which resulted from three causes, as follows:

Heart disease	115,337.
Pneumonia	112,821.
Tuberculosis	110,285.

If we add to the 115,337 deaths primarily due to heart disease, the heart failures which unfavorably turned the scales in pneumonia and tuberculosis, and further include the cardiac degenerations invariably present in those dead of Bright's disease and arterial diseases and accidents, it becomes apparent that at death about one-fourth of all persons show some form of chronic cardiac change; if infant mortality be excluded, this proportion will be considerably increased.

The report of the Provost Marshal threw a great light upon the incidence of disabling diseases in young men, revealing in the medical examination of 3,208,446 persons approximately 950,000 who were unfit for unlimited military service, and 521,606 unfit for any military service whatever. An analysis of the causes for total rejection shows that the greatest number (61,142) was due to diseases of the heart and blood-vessels. No account is here taken of cardiac cases accepted and placed in Classes A, B, and C, or which altogether escaped detection.

We may consider as established facts, therefore, that in this country there is an absolute cardiac mortality occurrence of 11 per cent, and a determined morbidity inci-

[1] Read, by invitation, at the meeting of the American Association of Electrotherapeutics and Radiology, Philadelphia, September 17, 1919.

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dence of 13 per cent in a large group of physically unfit young men.

Together these statistics sufficiently emphasize the wide prevalence of cardiac affections, and indicate the real service of any dependable and reliable means whereby our knowledge of these conditions may be advanced and made more exact.

Any considerable application of the string galvanometer to the study of heart disorders extends over a period of about ten years. During the first five years it was chiefly employed by a few investigators working in laboratories, or conducting researches in the clinics; during the more recent period it has had a much more general and wide-spread trial in routine hospital and consulting work, and, to some extent, in military medicine. In the light of this accumulated experience we may now attempt to make answer to those who have awaited a more extended test of the method before forming a judgment as to its utility, and who would ask: "Of what practical value is the electrocardiograph? In what particular aspects of the large group of cardiac patients is an appeal to its findings most likely to prove helpful? Has it superseded and made unnecessary all other forms of examination, or is it to be regarded merely as a valuable adjunct?"

Direct and brief replies to these questions will first be made in categorical fashion.

1. The electrocardiograph yields exact and definite information as to the mechanism of the cardiac contraction.

2. It is a certain and unfailing means by which the various forms of cardiac and pulse arrhythmia may be identified and classified.

3. It is the best and most searching means at our command by which to determine the presence of myocardial degeneration.

4. It gives definite evidence of the existence of cardiac hypertrophy and disturbed muscle balance, and by indicating the chamber chiefly affected aids in the identification of valve lesions.

5. Indications for treatment are often clearly shown, and the effects of such treatment may be clearly determined from time to time by making records and comparing them with others previously made.

6. It will often distinguish an extrinsic nervous influence from an intrinsic organic affection.

It may not be without profit to particularize somewhat in the clinical application of the foregoing, and to show in what way we may turn the information thus gained to practical account.

To establish the existence of an absolutely normal mechanism is obviously often of the greatest importance. Attention may be concentrated upon the nervous system in those with subjective cardiac symptoms who present normal findings. The problem presented by the cardiac neurasthenic is certainly much less puzzling than it once was.

Every physician has experienced the uncertainties and difficulties occasioned by an irregular heart. The tangle of the pulse arrhythmias has been solved, however, and we may now satisfactorily classify them, assign to each its proper importance, and, if demanded, institute the proper treatment, with the prospect of success in many cases.

The sinus arrhythmias of childhood, adolescence, and the neurotic need no longer give rise to needless alarm, and the mistake of enforced inactivity, unnecessary and harmful treatment. Children with irregular hearts of this form will be sent to the playground instead of to bed. I hope that hereafter fewer of them will be poisoned with digitalis than has been the case heretofore.

Heart-block in its various regular, irregular, complete, incomplete, and intermittent forms may be easily recognized. Its occurrence is often foreshadowed. A puzzling syncopal attack may be explained. Even interference with stimulus conduction over the primary branches to one or the other ventricles may be identified—a finding of grave prognostic import. The progress of

a case and the effects of treatment may be observed. The electrocardiograph, by bringing to light the lesser grades, has shown that heart-block is not as rare a condition as was formerly supposed.

Premature contractions are the most frequent cause of cardiac irregularity. We may now determine the cause of a "dropped beat" and if due to a premature contraction, we may determine the seat of its production, and, taken in conjunction with the other findings, estimate its prognostic importance. There is no longer any reason why every individual who shows an intermission of an occasional pulse beat should be rejected for life insurance, or put under unnecessary and usually harmful medical treatment.

Auricular flutter, one of the most elusive conditions in cardiac pathology, is usually to be identified only by means of the electrocardiograph. It is chiefly to it that we owe our knowledge of this condition. Recognition carries with it definite indications for digitalis administration, the effects of which may be accurately determined as frequently as desired.

Auricular fibrillation, the most important of the immediate causes of acute cardiac failure, is easily and certainly identified, and its control with digitalis, or allied drugs, accurately observed.

Paroxysmal tachycardia, in its simple form, sometimes attended with alarming symptoms, and rapid cardiac failure, is readily differentiated from other forms of tachycardia.

Pulsus alternans is the only cardiac and pulse disturbance in which the disordered action is better revealed by the polygraph than by the electrocardiograph, although the electrocardiograph will in other ways reveal the grave myocarditis which lies back of the production of alternation of the pulse.

One very important result of the modern investigation of cardiac physiology and pathology has been the increased recognition given to the importance of the myocardium. The condition and functional capacity of the heart muscle are much more important than the anatomic valve lesions. The determination of the character of the rhythm of the heart is much more important than the detection of a murmur. The electrocardiograph is a valuable and searching means by which the actual condition or quality of the myocardium may be estimated. Not only are the effects of fibrofatty changes revealed in abnormal curve changes, but hypertrophy of right or left ventricle, or auricular hypertrophy, are all easily detected, and may be translated into terms of valve lesions or other causes of hypertrophy, and assigned their proper value.

Chronic lesions and degenerations will evidence their presence by recognizable deviations in the character, time relation, extent, or direction of the electric waves produced by the cardiac contraction. In the same way the action and effects of various cardiac drugs, favorable or unfavorable, may be observed and compared. Such observations make for exactness in therapeutic measures and methods.

By revealing slight derangements, its use conduces to the early recognition of cardiac affections, and the early institution of measures designed to conserve the myocardium. It substitutes a definite method to replace conclusions based upon empiricism.

In certain acute infections attended with a liability to selective effects of the specific toxins of the disease upon the myocardium and the bundle of His, observed particularly in pneumonia, diphtheria, and rheumatic fever, such effects may be estimated or clearly determined. The knowledge thus gained has an important bearing upon the immediate treatment and the more remote management.

While the electrocardiograph may, in part, replace the ordinary methods of clinical investigation, it should be regarded as supplementing them. Some of its most valuable findings are not revealed by other methods. Electrocardiography has added a

new, a valuable and difficult chapter to the subjects of cardiac pathology and physiology. Its use has become essential to the modern treatment of cardiac disease. A hospital without its heart station cannot now be considered as fully equipped, and no internist may longer consider himself abreast the times who does not make use of this method, and who does not understand cardiac disorders written in electrocardiographic terms.

To summarize, in conclusion, the electrocardiograph has solved the entire question of irregular or disordered mechanism of the human heart, and has given the physician the confidence of real knowledge; it has profoundly influenced and added exactitude to prognosis; it has potentially abolished the promiscuous, harmful, and excessive administration of drugs, capable when wrongly used of acting as cardiac poisons, and has clearly shown the lines along which their use should be directed. The new clinical observations have stimulated and directed a host of laboratory researches of the most valuable nature along anatomical, physiological, pathological, and pharmacological lines. There is little doubt that this instrument in competent hands will carry us still further along these lines.

CLINICAL OBSERVATIONS ON THE THERAPEUTIC VALUE OF OVARIAN RESIDUE IN HEMORRHAGIC CONDITIONS OF THE UTERUS DUE TO DYSFUNCTION OF THE OVARY.

BY HARVEY A. TYLER, M.D.,
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With a full realization of the rapidity of the advancement of knowledge of the endocrine system, I feel that the experience of the last sixteen months in the clinical use of ovarian residue, in suitable cases, with the remarkable results obtained, is worthy of report.

Influenced by the reports on extracts of corpora lutea, I employed them in cases when indicated and was disappointed in the results, particularly in cases of deficient or lessened menstruation (so-called amenorrhea), cases of underdevelopment, in premature menopause (surgical), and in true amenorrhea due to narcotism. In the premature menopause (surgical type) the primary results were startling in the improvement of the usual syndrome for the first week or two; then, even though dosage were increased, the patient began to slip back to the former condition, apparently because of the need of the entire ovary. Under extract of the whole ovary the patient's symptoms subside and complete relief is obtained. In the other type of cases, amenorrhea of narcotism, menstruation was reëstablished, where it had ceased anywhere from sixteen months to seven years. In deficient or lessened menstruation the quantity was increased, but like the cases mentioned above there were repeated reports of clots, whereas similar cases under like dosage of ovarian substances, the whole ovary, menstruated or had increased menstruation without clots.

These results showed clearly that there was a hormone produced by the residual portion of the ovary, the part containing the interstitial gland. Accordingly I asked for a preparation made up of the balance of the ovary after the corpora lutea had been removed. The Department of Experimental Medicine of Parke, Davis & Company supplied me such a solution put up in ampoule form for hypodermic administration, each mil in ampoule representing 30 grains of moist ovarian residue. Believing that such substance would inhibit the action of the corpora lutea, I administered it in cases in which I thought the hemorrhagic condition was due to loss of balance of the endocrine system due to deficient metabolism or di-

minished hormone production of the interstitial gland (residual part of the ovary). By administering the ovarian residue hypodermically the balance in the endocrine system would be restored and the hemorrhage controlled.

May 23, 1918.—The first case was a woman, twenty-four years of age; menorrhagia profuse, with clots, lasting seven days. Began administration hypodermically every other day. Next menstruation five days, no clots; next menstruation four days, no clots and lessened quantity. Result, diminution of flow and no clots.

May 23, 1918.—Woman, twenty-four; profuse menstruation three to four days, "but flow comes in big clots." Unwell twice in last five weeks. Given 9 ampoules; result, menstruated three days, no clots. Only case showing reaction after injection. Felt sick and vomited after injection.

May 23, 1918.—Woman, twenty-four; dysmenorrhea and metrorrhagia. Unwell every two to three weeks; flows five to eight days; three or four napkins a day; pain and nausea; confined to bed one day. Treatment began May 29. Unwell June 24 for three days, July 6 for three days, July 27 for 3½ days, and Aug. 17 for 3½ days. Last two times less pain and no nausea. Result, interval lengthened, period shortened, pain lessened, and nausea ceased. Had girdle pain when injections were given at too close intervals, probably overstimulation of suprarenal glands.

June 19, 1918.—Woman, thirty, married, two children. May 10, lifted tub, began to flow. Should have been unwell May 4; always regular, flowed until June 19, when I first saw her. Flowing freely, large clots, decidedly anemic. Injection of ovarian residue June 19 and 22; flow ceased. Usual menstruation six to seven days, interval twenty-eight days. Next menstruation flowed 3½ days, no clots. Ampoules ovarian residue given twice a week; subsequent menstrual periods three days with administration of one ampoule a week. Ovarian residue seems to act specifically in cases like this after abortion.

Woman, thirty-three, married, two children, on June 19 reported she menstruated every two weeks, profuse, with pain. Began ovarian residue and administered twice a week. Not unwell for twenty-five days, when she flowed four days, quantity lessened; flowed July 22, 3½ days, no pain or clots; flowed August 16, 3½ days, no pain or clots. March 22, 1919, returned, and has been regular with four-day period until now; flowed five days. Excellent result in diminishing flow and shortening of interval, also showing the lasting result.

Woman, colored, twenty-two, married, no children or miscarriages. "Constant flow" began four months ago; was curetted without result. Still flowing with small clots. Treatment begun June 25. One ampoule ovarian residue every two days; 29th, flow decreasing, stopped July 4. Menstruated July 25 for four days and reports no clots, another case showing diminishing flow and no clots.

Woman, colored, twenty-eight, married; three children and one miscarriage at four months; menstruating every fourteen days, flowing eight to nine days. Flows freely with clots. Began treatment June 27 and on 29th refused treatment. Came back August 27 and asked for relief. (No record of date of this menstruation.) Unwell September 30, three days, no clots; October 28, three days, no clots; November 28, three days, no clots. Patient given ovarian residue three times a week during September and one a week thereafter. This patient complained of girdle pains, and the quantity of residue was reduced, with subsidence of the pain. Again possibility of overstimulation of suprarenal glands.

Woman, twenty-nine, married, has had four miscarriages self-induced; menstruation twice a month for six months. Unwell June 23 to 28, five days. Treatment begun June 27; did not flow again until July 21, flowed until 24th; treatment stopped. Showed action of residue in reducing amount of flow and frequency.

Woman, thirty, married; marked ane-

mia; factory worker; last menstruation sixteen days, previous nine days, always over a week. Treatment begun June 29; flow stopped July 3. Menstruated July 15 to 18, three days, no clots, eight napkins; next, August 15 to 17, three days, no clots; patient says "feeling fine, can run now." Shows marked action in controlling flow, probably by controlling excess corpora lutea.

Woman, twenty-seven, married; one child, no miscarriages; right ovary and appendix removed seven years ago. Has menstruated at intervals of three or four months since operation. Flows usually twenty-five days; last period forty days. She is decidedly pale, anemic, and tires easily; interval of fourteen days. Now been flowing twelve days. Began treatment July 9, three times a week; stopped on the 11th. Treatment continued until she left hospital with no further flow, August 1, 1918.

Woman, twenty-three, menstruating irregularly, every two or three weeks, lasting eight days; luetic, with ununited fracture of jaw. Had but five treatments, though menstruation stopped in five days. No conclusion was reached in her case.

Woman, thirty-five, married; menstruation 28-day type, regular five to six days. No children, two miscarriages. Has been flowing for two months, profuse. Has had operation, both tubes and one ovary removed. Treatment, one ampoule daily; flow ceased on fourth day. August 24, menstruated normally. Remarkable result in controlling hemorrhage.

Woman, nineteen, single, no children or miscarriages. Always regular; during last month has menstruated three times. Not pregnant. Menstruated July 16, 17, 18, and again July 27, 28, 29, and 30. Ovarian residue given July 30, August 1, 6, and 8; flow ceased. No conclusion; time of observation too short.

Woman, twenty, married; menstruated normally until four months ago; been unwell twice each month since. Menstruated July 14 to 17; began again July 27, flowing to July 30. Began giving ovarian residue July 30 and August 1, then three times a week; stopped August 8. September 10 began flowing for three days. October 15 to 18 flowed three days.

Woman, twenty, married, had miscarriage one and a half years ago. The hemorrhage was free, necessitating curettage. She again became pregnant, progressed four months, miscarried, with profuse hemorrhage, and was again curetted. She returned home and began to bleed, for past twenty days profusely. Ergot, astringents, and hemostatics used, no result; stypticin used, no result. Saw patient August 12; ordered ovarian residue, 1 ampoule given daily for three days; all hemorrhage stopped. September 26, patient menstruated normally. Result of ovarian residue as styptic, as in previous case.

Woman, married, twenty-two, for last nine months has been menstruating every two weeks. Began August 11 and flowed until 17th, inclusive, profuse, with clots first few days. Again menstruated September 6; stopped Wednesday, the 11th. Says quantity reduced one-half. Treatment August 15 and 17; then refused until 27th; then three times weekly, until September 18. Showed action of ovarian residue in reducing clots, prolonging interval, and decreasing amount of flow.

Woman, married, forty-seven, one child and one miscarriage. Menstruation 28- to 31-day interval, lasting seven to ten days. For last three years menstruation irregular, from three weeks to three months. Unwell July 30, profuse August 2 and 3, lessened 4th, 5th, and 6th. Began treatment August 15 triweekly, injecting ovarian residue. Began menstruating Wednesday, August 21; stopped Sunday, the 25th. Next menstruation September 15, first three days profuse, scanty last two days. Period reduced, despite alcoholic stimulation, in duration and quantity.

Woman, married, thirty-three; three children; miscarried at six months, in bed ten

days. Six days ago "a large ball" was discharged; then bled freely. Came to hospital, now five weeks since miscarriage, flowing freely. One tube of residue given September 4 and 8; flow ceased. October flowed regularly. Another case showing result as styptic.

Woman, married, age forty-two, no children or miscarriages. Menstruation history regular up to one and a half years ago, when she had two-week period; then regular up to December 18; flowed every day during December and January enough to soil napkin, then profusely in February. Used various styptics, including stypticin; no result. Began ovarian residue injections February 14, given every other day; flow ceased February 22. Flowed normally March 5, 6, and 7. Residue discontinued March 24. Normal menstruation April 9, May 6, June 14; day and a half, scanty and pale, August 5; none since June 14. Showing action of ovarian residue in hemorrhagic condition of menopause.

Woman, married, thirty-one. Said she started to flow January 22 and menstruated until February 15, when she presented herself for treatment. This patient was given more injections of ovarian residue than any of the other cases and fooled the nurse and interne. This case is mentioned because of the puzzling report. Menstruating one day and stopping next. Proven to be a malingerer. Now says 33 days between periods.

Married woman, thirty-eight; has four children. Menstruated every twenty-one days, six to seven days. Started to flow February 8 and has been flowing continuously since. Uses four and five napkins a day. Says similar condition eighteen months ago, when she flowed for six weeks. Has lues. Ovarian residue ordered and given daily for forty days, with no effect. Refused curettage until fortieth day, when she was curetted. Uterus soft, much degenerated endometrium; packed; ceased flowing in about fifteen days. Was it a syphilitic degeneration of endometrium or was hemorrhagic condition due to intense mercurial treatment? This case is the one absolute failure to check hemorrhage where no pathology was palpable in the pelvis. Medication was continued in this case for experimental purposes after early refusal of curettage.

Woman, married, thirty-three, one child and two miscarriages. Usual flow seven days, using six napkins a day, with clots for first two days. Treatment begun March 27; menstruated April 22 to 26, five days, quantity less and fewer clots. May 19 unwell four days, no clots, two napkins a day. Reported August 21; menstruated four days, no clots, no pain, two napkins a day. Treatment triweekly March 27 to May 8. A most marked regulation in quantity and clots.

Woman, single, forty-three. Menstruation history always regular until four weeks ago, when she began to flow profusely, soaking four or five napkins during day and four or five at night. Pelvic examination negative; markedly anemic. Began ovarian residue March 29, given April 2, 4, 6, and 9, flow lessening daily until it ceased, on April 9. Returned May 24; ovarian residue given 24th and 26th; stopped 26th, had been flowing for nine days. Ovarian residue ordered once a week. June 8 to 12 flowed, only three napkins; July 14 to 16, one napkin each twenty-four hours. August 9 to 13 one napkin a day. Menorrhagia of menopause; result excellent.

Married woman, twenty-six, with history of menstruation regular until married. Now unwell every two weeks, lasting ten days. Took treatment with great irregularity. Irregular sexual habits. No conclusions.

Woman, married, thirty-eight, one child; has had infection with metritis and salpingitis and has been operated upon for repair of perineum. Curetted July, 1918, and radium used. No flow for six months; flowed eleven days in March, nine days in April, beginning April 22. Ovarian residue given May 4, 8 and 16; began menstruating May 17, lasting five days. No clots, less

quantity. Ovarian residue given May 26, June 2, 6, 13, and 18. Menstruation began June 13, A.M., to June 17, A.M., four days; no clots and quantity lessened.

Woman, married, forty-six; one child, no miscarriages. For last year menstruations have been irregular—irregularity of menopause—has metritis and salpingitis, has been flowing continuously for three weeks. Ovarian residue given June 2, 4, and 9; flow ceased. No flow again until August 1, another case showing action in controlling flow at menopause.

Woman, married, thirty; no children or miscarriages. Lues present. Operated upon November, 1918; both tubes, left ovary and part of right ovary removed, also appendix; examined and given tuberculin test. No flow since operation. After first tuberculin test flowed six days, then at intervals three-day flow after each tuberculin injection until June 4; since then no intervals. Ovarian residue injections given June 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, and 20. Flow lessened after fourth injection and ceased entirely June 22. Again had tuberculin injection; began flowing July 14, stopped 18th by ovarian residue injection. August 2, no tuberculin injection since and no flowing. Rather remarkable that injection of tuberculin should cause flow which was controlled by ovarian residue.

Woman, married, twenty-seven; no children, no miscarriages. Menstruation usually every two to three weeks (never over 21-day interval). Flows one week, profusely first night, and next day with clots and flooding. Last menstruation June 3 to 12 inclusive. Ovarian residue begun June 14, given three times a week. Next menstruation June 27; flowed six days with lessened quantity and "smaller clots." Menstruated July 23, interval twenty-eight days; flowed four days, quantity lessened, and "very small clots," showing marked diminution of flow. Clearing up of clots and lengthened interval.

These injections of ovarian residue in twenty-nine cases were all given intramuscularly either in the gluteal or deltoid region. There has never been any irritation or discomfort to the patient providing the gluteal area used was above the intertrochanteric line and 2 cm. from the spinous processes, nor in the deltoid area, providing the tendinous portions were avoided. Ampoules are always placed in hot water before using.

CONCLUSIONS.

1. Judging from the fact that administration of lutein (in cases that have previously menstruated without clots) produced clotting, and from the fact that clots were reduced or disappeared in the preceding cases, I believe that the interstitial glandular portion of the ovary has an influence on the menstrual flow through its hormone —that is, it prevents formation of clots in menstrual flow.

2. That in certain cases of interrupted pregnacy in which we have an increased corpus luteum (cases in which hemorrhage was uncontrolled by various styptics and even curettage), the ovarian residue acts as a specific in that the hormone of the interstitial gland balances the action of the corpus luteum, restoring the balance in the endocrine cycle, and thereby controls hemorrhage.

3. I believe that there is an intimate relation between the cells of the cortex of the adrenal gland and the interstitial cells of the ovary. Loeb says these cells are identical embryologically. In two cases too frequent administration produced girdle pains, which could be relieved by diminished or increased administration of ovarian residue. Administration of arsenic (salvarsan) inhibits action of adrenal gland—also checks menstruation when given during period.

4. The marked failure in one case was in my estimation due to the fact that there was a luetic degeneration of the ovary and endometrium and that the ovarian residue could not restore the endocrine balance (or

was it due to the intensive mercurial treatment destroying the activity of the injected ovarian residue?).

5. The remarkable action of the ovarian residue was shown in this series of cases, with and without palpable pelvic pathology, in the absolute certainty with which the amount of the menstrual flow could be reduced, the disappearance of the clots, and especially the lengthening of the intervals between menstruations.

6. In two of the cases the mammæ were markedly reduced in size.

7. These cases taken in conjunction with a considerable experience with corpora lutea and the whole ovary convince me that we have in the ovarian residue a valuable and useful adjunct to our glandular armamentarium when it is used in suitable cases.

25 E. Washington Street.

COMMON SENSE IN PUBLIC HEALTH.

BY THOMAS W. JACKSON, M.D.,
Assistant to the Commissioner of Health of Pennsylvania.

Disease-producing conditions in a community constitute an infirmity to be cured, and fortunately both the infirmity and the conditions producing it are curable. Common sense—which is community sense—is perhaps the largest factor in this cure; hence the title of this paper.

Preventive medicine knows no denominational or sectarian separations. The State Department of Health desires that every legal practitioner of medicine in Pennsylvania shall consider himself a part of our disease-preventing machine. It desires from the profession, as its agents, loyal support and assistance quite as much as conformance with the law in rendering reports; it desires our constant assistance in many ways, and asks that we promulgate throughout our various communities the true aims and purposes of the Department.

We sometimes even wonder whether all physicians realize these purposes, and occasionally we have evidence of reactionary influences at work in the community. Recently at a particularly enthusiastic meeting of the various women's betterment agencies of a county, met to formulate plans for assisting in the public health work of the State in that particular county, a woman presented an informal protest from some of the men of her family and community, including at least one minister, against the intrusion of the State Health Department in asking for medical inspection of schools and community follow-up work in the homes of schoolchildren. The resentment seemed to be closely linked with a fear that the women would not be paid for the social service rendered! Surely this is the profiteering spirit gone mad.

Fortunately these outcroppings of selfishness and ignorance are infrequent, but they serve to indicate that the duties, privileges, and obligations of the individual citizen in protecting the public health and in bettering the social fabric are not universally appreciated as yet; and that benighted souls with sordid ideas exist in the most forward-looking communities. It is probably not worth while to point out to such individuals that the purpose which actuates the physician in preventive medicine actually impairs his financial income and involves the highest form of self-sacrifice.

To medical men—many of whom have so recently stood, shoulder to shoulder, facing the common national enemy, looking after the public health of the soldiery as well as binding up their wounds, at the cost of sacrifice, financial and personal, unequaled in any of the other professions—sordid considerations cannot appeal.

There is needful, therefore, only a clarifi-

cation of the purposes of the State Department of Health. These purposes have been announced to the public from time to time and will be so announced hereafter. Whenever the Department policy and purpose is not clearly understood inquiry is invited and explanation is promised. The new health department administration at Harrisburg is now well launched on its programme and desires the support and sympathy of every citizen. The warfare against disease and disease-producing conditions is perpetual. It will never be finished. There is no permanence of corrected conditions unless effort be constant and continuous.

Then, too, the impossible must not be expected. Our limitations must be admitted. Our abilities to combat communicable diseases are not equally effective.

For example: of the infections, the filth diseases—largely acquired by ingestion—are both theoretically and practically preventable; so too are the parasitic and insect-borne diseases.

Most baffling of all are the infectious respiratory diseases, a large and important group, which prevail endemically and epidemically—and here we must temporarily admit failure of control. I say temporarily, for no one doubts the ultimate conquest of these death-dealing diseases. We must, however, concentrate our effort upon this problem, avoiding the spectacular and declining to accept the unproven claims of the faddist, whether they relate to methods of communicability or cure.

Without entering into a discussion of the subject a few facts, related to prevention, may well be emphasized here.

1. Individual isolation is an efficient protection.

2. Experience has shown that ventilation alone is far from being an effecive safeguard, and whatever the value of fresh air may be from the therapeutic standpoint, ventilation alone must not be depended upon to prevent the spread of the infectious respiratory diseases.

3. Spray infection through the mucous droplet, projected into the air and, far more important, received fresh and teeming with living bacteria directly upon the nasal, conjunctival and buccal mucous membrane of another, through speech, cough, sneeze, song, or other vocal effort, usually in crowds or groups of people, is by far the most fruitful method of communicating influenza.

The indirect contact method, in spite of certain illustrated and highly colored newspaper stories based on articles which have appeared in public health journals, is not to be compared to the direct transfer method.

4. Any mechanical obstacle which intercepts the flight of droplets, such as a mask placed upon the patient, is useful in whatever degree it really intercepts the droplets.

5. In all diseases propagated by spray or droplet infection, efficient surface disinfection is called for, and this means knowledge and technique on the part of the physician, nurse, or public health agent who performs it. The methods described in pamphlet by the State Department of Health, and known as "sanitary cleaning," are considered adequate and effective if performed with thoroughness. Fumigation as ordinarily carried out is useless.

Out of recent experience and observation has arisen the realization that certain diseases hitherto considered unrelated are akin in the manner of their acquisition.

A few years ago we would hardly have considered measles as a respiratory disease, as a disease of adults, or indeed as a serious malady, but to-day there is general acceptance of the fact that it is primarily a respiratory infection, and that its complications, nearly all of them respiratory complications, give rise to a heavy mortality.

It would not have occurred to us that cerebrospinal meningitis is primarily a respiratory infection, or that mumps, diphtheria, the primary pneumonias, influenza,

tuberculosis, and scarlet fever may be grouped together. Yet upon a moment's consideration it will be evident that these diseases and others are all acquired through the gateways leading to the upper respiratory tracts. This realization gives us an important clue to prevention, a clue which we must individually follow up, however.

I confess that I am tempted to enter into detail, but the recognition of the fundamental principles is far more important to us all, and I therefore ask you to apply close scrutiny to the popular public health educational articles which appear from time to time, separating the wheat of truth from the chaff of untruth or half-truth. Far too much positive misinformation of the public escapes contradiction today.

Far be it from me to decry popular education in disease prevention, but let us see to it that such education be based on fundamental principles, and most of all that the teaching be truthful. It is far easier to spin attractive theories and make extravagant claims beyond the possibility of performance than it is to pursue a sane, conservative, forward-looking programme which takes due account of scientific limitations and the popular disposition to measure and regulate all effort and expenditure by promise of gain.

It is not pleasant, perhaps, to admit that economic interest is a greater urge to public health endeavor than is philanthropy, but it is a fact that must be faced, and fortunately most details of the public health programme, if not all of them, may be justified from an economic view-point and our motives may well remain both philanthropic and economic.

It is known that the State Department of Health is divided into numerous divisions, each with a special sphere of activity, and headed by a specialist in that activity. These divisions do not function independently but are coördinated with a single main object—the public betterment—in view. Thus epidemic control and laboratory investigation, child welfare, tuberculosis control, venereal disease control, public health education, sanitary engineering with pure water supply, the proper disposal of wastes and improved housing as its objects, the collection of vital statistics, the control of habit-forming drugs, school hygiene, the distribution of antitoxins and biological preparations, and public health nursing are all coördinately administered by the central organization at Harrisburg and with a single end in view.

Even to enumerate the activities of these various divisions would be undertaking too large a task. I can only state that the governing principles of the Commissioner and his advisers are: (1) the largest economy consistent with the most far-reaching results; (2) as little interference with local self-government as is consistent with the enforcement of the State laws; (3) an impartial enforcement of the law everywhere.

There should be a general recognition of the fact that communities are expected to govern themselves and to pass and enforce additional health ordinances, as well as to enforce the State health laws, and that this obligation must remain local and may not be passed on to the State Department of Health

I might perhaps mention the sphere of the epidemiologist, for every one who investigates a local outbreak of communicable disease in his clientele or family practice is in some degree an epidemiologist. In the public service the well-equipped epidemiologist must be something of the clinician, statistician, pathologist, bacteriologist, climatologist, lawyer, public health instructor, general hand-shaker and sympathetic citizen.

His life is one of vicissitudes, and taken altogether it is not always a happy one. He accumulates some friends but rather more enemies, and is often an object of suspicion. He can never count on popular or even professional approval of his work, and he must account as his sole reward

the realization of work painstakingly and conscientiously done. His mistakes follow him about like an ever-fattening Nemesis, and from the similarity of the term "epidemiologist" he is constantly mistaken for a specialist on epididymitis or an authority on demonology.

Yet there is constant variety in the life of the epidemiologist. No two outbreaks of disease are identical in all respects. Oftimes the qualities of a detective—analytic and synthetic—are needful to establish the truth, while in other cases the facts need but to be assembled for one to deduce the obvious conclusion.

Where laboratory diagnosis is involved local laboratory facilities should be employed if they be at hand, supplemented by confirmations by the laboratory of the State Department of Health in Philadelphia. It is hoped that a portable traveling laboratory will be available in the Department before long, in which event the necessary investigations, bacteriologic or chemical—or even autopsy investigations—can be made immediately and upon the spot.

Laboratory aid is not always required, however. Often the answer to the problem is readily obtained by the application of simple common sense.

The public state of mind in communities excited by sensational newspaper stories is often such as to cause a delay of application of the common-sense test until local fears are calmed by assurances from the visiting investigator. This applies to the lay public, and in somewhat less degree to the local medical public. The average practitioner sees the cases in his own clientele and knows little of those of his professional brethren, unless he chances to see them in consultation. A visiting investigator with the entrée to all households and the authority of the State behind him has a distinct advantage over the local practitioner.

I might perhaps tell something of interest concerning the health legislation of 1919 in Pennsylvania, but there is now in process of printing a pamphlet which will recite this legislation and which will present the new laws as passed.

Let me speak of the third-class cities.

Every community has special disadvantages of its own. If the community be an old and prosperous one these conditions are apt to be those of reaction and stinginess, begotten of selfishness.

In new towns rapid growth and a large foreign influx have necessitated heavy outlays of money and a burdensome tax rate. Personal indifference and insanitary habits are common to foreign persons who settle in a community for the sole object of making money rapidly, and these people usually imagine that liberty extends to the field of personal conduct, regardless of neighborhood rights.

Adequate financial support is indispensable, of course, and funds must be found, but there are many activities which require less money than courage. No higher type of courage is to be found in modern life than that shown by health officials who calmly withstand influences, social, political, and even religious, which would interfere with their strict and impartial application of the health laws, and who do it purely from the sense of a citizen's obligation. Such men and women deserve our gratitude and full support.

Generally speaking Pennsylvania's third-class cities can deal with every evil which besets them under existent State and municipal laws. New laws are the least of our needs. Even the control of venereal diseases, including regulation and quarantine, falls within the broad powers given us by law and by ordinance, and by local enforcement one may meet nearly every evil situation, provided he has the necessary courage and disposition to do so. A borough may throw the responsibility on the State by refusing to administer its own health matters, although it cannot escape financial responsibility. Not so in the city, however. The city must accept its obligation, administer itself, and accept the

approval or reproach which by action or inaction it earns and deserves. So let me hastily run over the rights, powers and duties which by law pertain to third-class cities.

Every city of the third class in its corporate capacity is authorized and empowered to enact ordinances for the following purposes:

To construct and reconstruct sewers and to extend the same beyond the city limits, and for the purpose of such construction or extension to take and occupy private lands and property.

To regulate or prohibit the running at large of cattle, hogs, horses, dogs and other animals, and fowls.

To make regulations for the enforcement of laws of the commonwealth relating to the control of communicable contagious diseases, and for the enforcement of the regulations and orders of the State Department of Health; to make regulations to secure the general health of the inhabitants, and to remove, prevent, and abate nuisances. To appropriate funds and contract for the collection of ashes, garbage, waste, and refuse.

To make all necessary orders and regulations to prevent the introduction of contagious or pestilential diseases in the city; to make quarantine laws for that purpose and to enforce the same. To erect hospitals for communicable diseases.

To provide a system for the inspection of buildings to insure their structural or sanitary safety.

The council of any city of the third class of the State of Pennsylvania may by ordinance create a Board of Health.

In all cities of the third class where the council of said city shall not elect to create by ordinance a board of health, the said council shall exercise all the rights, duties and obligations imposed upon boards of health in cities of the third class.

Boards of health or councils and commissioners acting as such create local health officers with the powers and authorities of policemen. The board of health or the council and commissioner make and publish rules and regulations which when approved by the mayor have the effect of ordinances. Violation penalties and expenses incurred in carrying out regulations are recoverable for the use of the city.

Policemen everywhere, in cities and boroughs, should be required to know and enforce sanitary regulations and to warn or arrest those who violate them. When this practice happily prevails everywhere, public health responsibility will be properly distributed and the majesty of the law will cover sanitary ordinances as well as the civil and criminal codes.

Third-class cities, and in fact all communities, may and should provide and enforce community ordinances securing safe and clean supplies of pasteurized milk at fair prices for their citizens, infant and adult, and they should exclude all other fresh milk supplies as dangerous to health and life.

Every one must accept a share of responsibility and assume a part in the corrective effort to remove certain present-day conditions which are striking at the very life of the people through decreased infection resistance, which results from the deprivation of life-sustaining food in sufficient amount.

The recent startling disclosure of nutritional conditions in New York City, as shown by New York Health Department surveys, prove that such absolutely necessary foods as meat, eggs and milk are disappearing from the dietary of thousands of children. Infant mortality, the nation's greatest danger, is enormously increased by this situation.

No one fears the ultimate outcome or really doubts that right must eventually prevail. But let us who guard the public health not to be too prone to invoke the slow processes of that American panacea "education" in the present crisis, but rather let us insist on the application of laws already in existence, depending for justifica-

tion upon the quickening of the public conscience, without which conscience our nation cannot long endure.

Let me close as I began by bespeaking for the State Department of Health the loyal support of all medical men. By this assistance I do not mean such direct and immediate service as the prompt reporting of every case of communicable disease. Such reporting is not a service to the Department but to the State, and the violation of this mandate is punishable. We should report cases of contagious disease, of course, as good citizens obedient to the law, but give to the Department in a larger way our sympathy, our council, and our aid.

THE DIAGNOSIS AND TREATMENT OF PLEURAL EFFUSION—A CLINIC AT THE JEFFERSON MEDICAL COLLEGE HOSPITAL.

BY H. A. HARE, M.D.,
Professor of Therapeutics and Diagnosis.

It is my intention to-day to show you several cases which bring forward for consideration important points in the diagnosis and treatment of pleural effusion. You will recall that these effusions may be divided into three classes: those which are of the nature of transudates in which fluid of a comparatively low specific gravity, and a comparatively low content of albumin, accumulates in the pleural sac, or sacs, as the result of certain changes in the blood or blood-vessels; or through the pressure of growths which obstruct the normal flow of blood in the thorax; or, again, as the result of disease of the heart whereby venous obstruction is produced, either through an enlarged organ pressing upon the vessels or by the accumulation of blood in the great venous trunks of the thorax as the result of failure of the cardiac valves. The second class of cases belongs to the exudates and arises because of an inflammatory process which may, or may not, involve the whole pleural sac. Both transudates and exudates of this character are usually clear serous fluids. Last of all we have an effusion which consists of pus, or, in other words, the formation of an empyema. In some instances the pus seems to be formed primarily. In other instances, even under the most careful antiseptic precautions, the effusion at the first tapping is found to be serous, later becomes cloudy, and within a short time is found to be purulent.

There are several cardinal points to be remembered in the diagnosis of pleural effusion before the physician attempts to differentiate its character. You will find that the differential diagnosis between consolidation of the lung and pleural effusion as described in text-books seems to indicate that if the various points are carefully borne in mind there should be little difficulty in determining which state is present, but when you get into active practice you will find that this differential diagnosis is often one of the most difficult which you will face, because each case differs to some extent from its predecessor because of the thickness of the chest wall, the quantity of effusion, and in the physician's ability to develop typical physical signs. In some instances, when one feels quite sure that an effusion is present, it is found that the physical signs are in reality due to a greatly thickened pleura, or, again, a malignant growth, or an adherent lung, may mislead the physician. In still other instances a hypostatic congestion at the base may lead the phyisician to the belief that there is fluid there.

Now, it is quite true that in most cases of consolidation tubular breathing, increased vocal resonance, and increased vocal fremitus will be present, and, without

doubt, these three physical signs are characteristic of consolidation, yet every one with experience knows that they are also found to such a degree in some cases of pleural effusion as to prevent our considering this triad of signs as pathognomonic. Conversely, in pleural effusion distant breathing and loss of vocal resonance and vocal fremitus are characteristic; but here, again, we sometimes find these physical signs so faint, or obscure, in cases of consolidation as to readily mislead the physician. There are, however, certain additional physical signs which taken in conjunction with those already named aid materially in reaching a correct diagnosis. Indeed, it may be said that they are the more important in determining the condition which is present. The first of these is the recollection that in any considerable effusion on the left side the heart is displaced to the right. In some instances, when the effusion is large, the apex beat may be actually outside the right nipple. In such a case there will be impaired resonance instead of high-pitched resonance in Traube's semilunar space, which is on the left side and which is normally resonant as the result of the near presence of the splenic portion of the colon. The only fallacy underlying the displacement of the cardiac apex in either right- or left-sided effusion lies in the fact that pericardial adhesions due to the same causes as the pleurisy, or due to a previous attack of pericarditis, may have anchored the heart in such a way that the effusion cannot materially displace this organ. Another physical sign which is of value, if it can be developed, is a depressed area of liver dulness downward. This sign is of value if it can be found, but is often absent when the patient is lying down, and may also be difficult to determine if there is much gas in the bowel or stomach. Furthermore, if the cardiac disease is responsible for the effusion the cardiac lesion not infrequently results in an engorgement of the liver, and this carries the lower margin of this organ down so low as to give rise to the belief that the liver is displaced downward, when in reality the change is due to its great enlargement.

A sign of very great importance, which, however, depends upon the more or less skilful use of the *x*-rays and particularly the employment of the fluoroscope, is the condition and position of the diaphragm. In effusion the diaphragm is flattened, whereas in consolidation it is usually drawn up because of the fact that there is little air on that side of the chest and compensatory breathing on the opposite side causes wide movements of the diaphragm.

Another point in the diagnosis of effusion which is of value, if it can be found, but which, in my experience, is by no means constant, is the so-called triangle of dulness of Grocco close to the vertebral column, on the opposite side from which the effusion is supposed to be present.

Last of all, although, possibly, this point should have been mentioned first, since inspection usually precedes other methods of examination, we have the appearance of undue fulness of the side affected and possibly even bulging in the interspaces accompanied by unilateral fixation of the chest, which is the more marked because on the opposite side compensatory respiration causes increased movement.

Dyspnea, if present, is a valuable objective symptom in association with the others that we have mentioned, but it is quite remarkable how many patients with large pleural effusions have no dyspnea at all, unless they are put through vigorous exercise, and this is particularly the case in the effusions which are due to tuberculosis, and which may have been made so slow and insidious in their onset that the remaining portion of the respiratory apparatus has been able to carry out its function readily in a compensatory sense. The history of the patient is also of considerable value as to previous acute illness with symptoms of pleurisy or pneumonia, or there may be evidences of cardiac disease.

Renal disease may be a cause, although in most cases in which renal disease is responsible for pleural effusion the latter is bilateral, rather than unilateral, unless the renal disease has secondarily induced cardiac disease, which, in turn, has by extra-cardiac or intra-cardiac pressure produced effusion.

When the attempt is made to determine whether an effusion is serous or purulent there are no physical signs which are so characteristic, so far as the chest itself is concerned, which enable us to make a positive diagnosis. The probability of pus being present is increased by the previous history of a pneumonia within the recent past, and it goes without saying that the persistence of fever, or its return, after the pneumonia reaches its ending, is a very definite indication that pus is present. On the other hand, it must never be forgotten that the patient may be febrile from some other cause, as, for example, a pyelitis, or some other infectious process, in another portion of the body.

When we turn to a consideration of the treatment of these conditions it has been generally supposed by many practitioners that on the discovery of fluid it should be immediately removed. There are many exceptions, however, to this rule. It should not be immediately removed if it is serous unless it is present in sufficient quantity to interfere with the function of important organs and markedly disturb the patient's comfort. Time should be allowed for nature to produce absorption, and this chiefly for several reasons: First, because in many instances nature will cause absorption of transudates if proper treatment is carried out, and in some instances even exudates will be absorbed. Another reason is, particularly where an exudate is present, that in the act of tapping, through some error of technique, infection of the chest contents may be produced. Again, if the fluid is removed rapidly there is a tendency to its speedy return, whereas if nature removes it gradually this does not occur. Drawing off fluid may permit inflamed pleural surfaces to become approximated with consequent formation of adhesions. In some instances drawing off a small quantity of fluid starts the process of absorption whether it be a transudate or exudate. Whether this is the result of relief of pressure, or is due to what the French call autoserotherapy, is a question. By autoserotherapy is meant an injection of a few drops of the fluid into the chest wall which is supposed to provide ferments, or activators, which start absorption. If there is reason to believe that the effusion is due to tuberculosis, there are additional reasons why its removal should be considered with the greatest care. I have repeatedly pointed out that its rapid removal frequently results in a lighting up of a low-grade tuberculous process already present, and there is reason to believe that, in a certain proportion of cases, nature pours out the fluid in order to place the lung which is diseased at rest, for reparative processes cannot take place while the lung is active. To some extent these words hold true in regard to empyema, if it is tuberculous in origin. I have more than once seen cases presenting the signs of tuberculosis and effusion, and proved to be purulent by the use of a needle, in which the pus, being in the nature of a cold abscess, mechanically placed the lung at rest and produced no sepsis. Leaving it untouched, along with proper treatment of other kinds, has been followed by a gain in health and a great increase in weight. There is always danger in removing tuberculous pus that a tuberculous cold abscess may be infected and changed into an abscess due to other pyogenic germs.

Other points might be given in regard to the differential diagnosis and treatment of pleural effusion, but these seem to be the points which are of the greatest importance in connection with the three cases which I have shown you to-day. One other point, however, should be taken up before this subject is passed by, namely, the recollection that interlobar empyema may be present, or loculated collections of pus due to adhesions may produce physical signs which will lead the physician to the diagnosis of

intrathoracic fluid. This diagnosis will seem to be contradicted by the humiliating experience of getting a dry tap, when if the physician had been fortunate enough to introduce the needle only an inch or two forward, backward, above or below the point at which he entered, he would have had a positive, instead of a negative, result. This type of failure can be largely put aside by the skilful use of the *x*-rays.

HYPEREMESIS GRAVIDARUM TREATED WITH APOTHESINE.

BY LOUIS LEVY, M.D.,
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The medical profession will, of course, realize that it is no news to state that persistent vomiting of pregnant women is a condition that has taxed the resources of the profession in the endeavor to combat and alleviate it. A multitude of medicinal agents have been suggested and used to control hyperemesis gravidarum, as will be realized if medical text-books are consulted. That such an array of preparations has been used is due to the fact that the persistent vomiting in pregnancy, if not controlled, is not only exhausting to the prospective mother, but it may result in an interruption of the pregnancy and loss of the unborn child.

The one medicinal agent that has been most widely used, since it usually gave prompt results in such cases, is cocaine, either alone or in combination with bismuth, cerium oxalate, and other preparations. It is also believed by most of us presumably in the best position to know that the only merit possessed by the various medicaments that have been reported as successful in the control of persistent vomiting resided in the amount of cocaine the formula contained. The administration of cocaine, of course, is undesirable because of its toxic effects and the possibility of inducing the cocaine habit.

Something over a year ago, realizing that a new American synthetic local anesthetic, aposthesine, had proved itself very efficient as a local anesthetic of very low toxicity, and without the possibility of inducing habit formation, I decided to experiment with it in the hope that it would replace cocaine as a preventive of nausea.

I began my experiments by administering apothesine in 1/12-grain doses, combined with liquid taka-diastase. My early experiments were on patients who were not badly nauseated, so to speak, mild cases. The results of these preliminary tests were all that could be desired; patients were all relieved, and, in order to test this fact, I instructed them to eat an ordinary meal within three hours after taking the apothesine, and all of the patients reported being able to continue their regular diet without any return of the symptoms of nausea.

At first I used the regular apothesine as found on the market, but later on the manufacturers supplied me with some experimental tablets of apothesine which have been used since. My records show that in nearly every instance doses of from ⅛ to ¼ grain have been successful in relieving the pregnant women of the nausea.

Nothing is gained by the publication of a long series of case histories, but the three following ones are offered as illustrative of the general class of patients that I have treated in this way:

No. 1.—Mrs. N., about two months pregnant. Had been vomiting about six weeks, approaching pernicious type. She was told that she probably would have to have interference. Put on apothesine grain ⅛ in solution of elixir lactopeptine and told to take as food whatever she liked best five minutes after each dose. Improvement was immediate, and the patient was delivered at term.

No. 2.—Mrs. J., nausea and vomiting started directly after missing of menstruation. Continued until patient was unable to be out of bed. Apothesine grain ¼ in taka-

diastase with usual directions. Patient improved and delivered at term.

No. 3.—Mrs. M., vomited after missing of menstruation. Solution of apothesine started. Patient is relieved and takes food after each dose. She, however, is compelled to take apothesine solution when nauses starts. She is now in the fourth month.

My experience with apothesine in controlling the vomiting of pregnancy has been so successful that I have applied the same methods in four cases of postoperative vomiting and am gratified to report similar successful results.

In one case of acute dilatation of the stomach the vomiting was controlled by the administration of apothesine in liquid takadiastase, but, of coure, this did not have any effect upon the dilatation *per se*.

ANTIMENINGOCOCCAL ACTION OF CERTAIN DYES.

BINGER, in the *Journal of Infectious Diseases* for October, 1919, states of dyes studied the following were found to inhibit the growth of meningococci: gentian violet, crystal violet, brilliant green, bismarck brown, basic fuchsin, vital red, fluorescein, and eosin had no inhibitory action.

The study of the comparative action of methylene blue on various types of meningococci and other pathogenic organisms showed that the growth of meningococci was inhibited at dilutions which failed to inhibit the growth of the other organisms with one exception.

The inhibitory action of methylene blue on the meningococcus and the gonococcus, biologically related organisms, was the same.

No fixed point of dilution has been established at which methylene blue inhibits the growth of different suspensions of meningococci. This varies with the number of viable organisms present in the suspensions.

For a given suspension, however, the inhibitory point is constant.

A study of the comparative action of methylene blue, formaldehyde, mercuric chloride, and phenol showed mercuric chloride to exert the most powerful action, phenol the least, while methylene blue and formaldehyde exerted an equal influence intermediate between the other two.

The presence of native protein of inflammatory cerebrospinal fluid did not interfere with the inhibitory action of methylene blue on the meningococci.

The selective inhibitory action of methylene blue on the growth of the meningococcus group of organisms may be of a specific chemical nature, or it may be nonspecific, and due to the fact that the meningococcus is a relatively frail organism requiring, when artificially cultivated, a fairly congenial environment. To determine the specificity of the reaction would require the use of a greater variety of structurally allied chemicals and the titration of each against a variety of bacterial suspensions.

This work was approached rather from the practical point of view, and an inquiry into the nature of the inhibitory phenomenon has not been attempted.

Contact with any considerable number of cases of epidemic cerebrospinal meningitis emphasized the fact that serum treatment as commonly practiced leaves much to be desired. Under ideal conditions, that is, early treatment with an effective serum, results are of course of proved success. But under conditions of late diagnosis and treatment with serum obtained from presumably reliable sources, but often of little or no value, results are frequently discouraging.

The hope of finding a chemical therapeutic agent for the meningococcus group of infections is what prompted this study. Methylene blue may possibly fill the requirements. It inhibits the growth of meningococci in fairly high dilutions. It is relatively non-toxic, is said to be diffusible through the choroid plexus and to have a specific affinity for nerve tissue.

Application to *in vivo* conditions from experiments conducted *in vitro* must, of course, be made with caution.

EDITORIAL.

THE PRESENT POSITION OF SPINAL ANESTHESIA.

The production of spinal anesthesia for surgical purposes has not been practiced for a sufficient number of years to approximate its normal level of value. Without doubt it can be used with advantage in a limited number of special cases, and equally without doubt it is unsuitable in the general run of cases if for no other reason than that it fails to wipe out consciousness, psychic shock is not avoided, and the importance of psychic shock is being more and more recognized as important as the years go by.

Some months ago at a meeting of the Royal Society of Medicine in London, Rood laid down the statement that in spite of considerable opposition this method had obtained a position as one of the recognized agents for producing anesthesia, and also admitted that it had special dangers and that the persistence of consciousness during the operation was a disadvantage. Although an enthusiastic supporter of the method, he also emphasized the fact that spinal anesthesia should never be attempted in patients who are likely from their condition to be seriously affected by the fall of blood-pressure which is so often associated with the use of stovaine.

In his paper he tells us that he has always used stovaine, except in about 250 cases in which novocaine (procaine) was injected. His reason for giving up procaine was that although it produced perfect anesthesia it does not produce a muscular relaxation equal to that produced by stovaine. The solution of stovaine which he recommends is 5 per cent, which is increased in density by the addition of 5 per cent of dextrose. This solution is advantageous in that it is less diffusible than the cerebrospinal fluid and so remains in more or less one position after the injection, or it can be moved about by changing the posture of the patient.

This matter of posture is of great importance since the diffusion of all anesthetic solutions can be greatly influenced by moving the patient. Thus Rood points out that if a patient is placed upon his right side with his pelvis raised so that there is a steep slope from the third lumbar vertebra down to the middorsal region, and the injection is made between the second and third lumbar vertebræ, this fluid will sink downward in the spinal canal to the middorsal region, producing anesthesia of the right half of the body before producing any effect upon the left side, and if the patient is kept in this position for some minutes, before being turned on his back, the anesthesia will remain more complete on the right side and will extend higher on this side than on the left. Furthermore it will persist for a greater length of time on the right side and muscular power will return first to the left side.

Rood strongly recommends the dextrose stovaine solution when spinal anesthesia is to be used in children, because not being readily diffusible it does not so rapidly reach the vital centers at the upper end of the short spinal cords of these patients. Another advantage of the dextrose solution over plain salt solution containing stovaine is that it is more persistent, probably because a denser solution is in contact with the nerves affected. To such an extent is this true that almost double the dose of stovaine is required to produce equally long anesthesia if it is dissolved in saline.

An interesting question which arises is how long the injected fluid is capable of migration to points distant from the point of entrance. Rood states that while it is possible to vary the area anesthetized by the posture of the patient immediately after injection he has never found it possible after five minutes to increase the height of the anesthesia even by a very considerable elevation of the pelvis. In other words he thinks the stovaine becomes fixed in from three to five minutes. The practical bear-

ing of this is that during injection and for five minutes afterwards the patient's head and cervical region should be kept raised, and again that owing to the fixation of the stovaine at the end of five minutes there is not the same necessity of keeping the head and shoulders high throughout the operation as was at one time thought necessary. This is advantageous, because of the fall of blood-pressure which is often induced and which renders the prone position desirable.

The point which impresses us most of all in Rood's communication, however, is that while he advocates spinal anesthesia in a certain number of patients he believes that some method of benumbing the intellect is essential in the majority. Something must be done to prevent the patient from being present at his own operation, so to speak, and therefore he believes that spinal anesthesia should rarely be employed without employing so-called twilight sleep induced by morphine and scopolamine, or the use of a small quantity of some general anesthetic. Speaking in general terms he feels that for severe operations the method which he recommends has been to produce anesthesia with ether, then to inject the stovaine, discontinuing the ether for a time and then renewing its use to a degree sufficient to keep the patient unconscious.

We confess that this plan seems to us to amount to a straddle. The difference between the quantity of ether which is necessary for the patient when it is used as the whole anesthetic and the quantity which is required to produce unconsciousness and maintain it from time to time is so slight that the patient, in whom ether seems contraindicated, is not protected materially from its evil effects. Rood suggests that when operations which are not of great severity, like hernia or appendectomy, are to be done, twilight sleep be produced an hour before the operation and that the spinal injection be administered before the patient reaches the operating room. He is, moreover, a strong believer in the point which has been insisted upon by those most favorable to twilight sleep, namely, that all stimuli which may go to the brain through the eyes or ears should be shut off, and so the patient's ears are plugged with cotton and the eyes bandaged. It is remarkable how great an increase in the effect of scopolamine and morphine is produced by these measures.

Rood's opinions are based upon a sufficiently large experience to enable him to speak with authority. He tells us that he has had 8000 cases with two deaths. One of these was a case of obstruction of the small intestine and the patient was in collapse. After the injection a flood of stercoraceous material escaped from the mouth and the patient was apparently asphyxiated. The second case was that of a child of four years, more or less moribund, with gangrenous intussusception. In this case death occurred from the fall of blood-pressure caused by the stovaine when added to the shock already present. His opinion now is that in neither of these instances should spinal anesthesia have been resorted to.

The patients treated by spinal injection included persons of all ages from a few hours up to eighty years. The youngest was a new-born baby suffering from imperforate anus and umbilical hernia, and it is interesting to note that Rood claims that it requires relatively larger doses of stovaine to produce anesthesia in infants than it does in adults, giving as much as .025 of stovaine for the smallest baby and more for children of one or two years. He admits that elderly people are more liable to syncope if the anesthetic reaches the high level of the cord.

While Rood has had only two deaths, nevertheless he records a considerable number of patients who came so near death that their recovery seemed impossible. One of the difficulties in resuscitation is that while on the one hand it may seem advisable to invert the patient in order to get blood into the vital centers, on the other hand this cannot be done lest these centers be still further paralyzed by the drug.

So, too, vomiting at the time of injection

is by no means unusual if the anesthesia involves the dorsal cord. Headache is not very common, but sometimes it is very severe. This headache can occasionally be relieved by lumbar puncture with the withdrawal of about 20 Cc. of fluid. Post-anesthetic vomiting is very rare, but here we may remark that vomiting during an operation is by no means a comfortable complication.

Rood believes that spinal anesthesia is much less frequently followed by pulmonary complications than any other method, but he has seen bronchitis and pneumonia follow it.

Concerning the question as to whether any permanent paralysis of muscles, or permanent abolition of sensation, or trophic lesions persist he has not been able to find any reports. In 10,000 cases of which he has actual personal knowledge there was no permanent paralysis or abolition of sensation, with the exception of three cases of external rectus paralysis of the eyeball which lasted about three weeks. Curiously enough he finds that untoward effects are less prone to occur when the puncture is made between the eleventh and twelfth dorsal than when it is made between the third and fourth lumbar vertebræ, although he recognizes the danger of puncturing the cord at the higher level.

The chief type of cases in which he thinks spinal anesthesia is advantageous is in acute and chronic septic conditions with considerable toxemia, in which condition postoperative acidosis is very prone to occur.

Mr. Lockhart-Mummery considers that the chief advantage of spinal anesthesia is that it prevents impulses from the field of operation reaching the vital centers which these impulses can reach when a general anesthetic is used. He goes so far as to state that he believes that anesthesia with ether and chloroform will in a few years be used only in remote villages and for veterinary purposes.

On the other hand Cole disagrees in thinking that the dextrose solution is better than the saline and advocates that the patient should always be kept with the head low or in the Trendelenburg posture. He contradicts Rood in thinking that the glucose solution produces a more lasting anesthesia than the saline, mentioning an instance in which using a saline solution he removed a transverse colon and performed anastomosis in an operation which lasted fifty-five minutes, during which time perfect relaxation was maintained.

Possibly the most interesting criticism of Rood's statements was that advanced by Shipway, who expressed the belief that it was an error to consider that the dextrose solution is heavier than the saline, because as a matter of fact the specific gravity of the dextrose solution is according to his opinion 1.023 and of the saline solution 1.083. Shipway's criticism apparently explains Cole's ability to use saline-stovaine solution with the head down.

We think that most American surgeons will agree with Blomfield, who points out that if ether and chloroform are given properly they can be used to very materially modify shock, but he suggests that an excellent field for spinal analgesia is in those patients with active tuberculosis of the lungs or who have an artificially produced pneumothorax.

VITALITY VERSUS DRUGS.

A point which often receives less attention than it deserves is the consideration of a patient's vital resistance in combating disease. The existence of the human race is due to the fact that this power of resistance is being constantly exercised and is infinitely a more important factor in preventing and curing disease than drugs can be. Those who are alive to-day are in one sense representative of the survival of the fittest because their ancestors have possessed this vital resistance and so have not succumbed before they reproduced themselves. A clinical illustration of this fact is seen in the improvement which takes place

in patients who go away for their health. In many instances the climate, medicinal springs, or some other local agency, is given credit for the recovery which ensues, the more so because no improvement has taken place while the patient was under active treatment at home. Without doubt the chief cause of such improvement is due to the fact that a change of air and scene, a proper diet, suitable exercise, fresh air, and avoidance of business or household worries, are all factors in increasing vital resistance. This is notably the case with patients suffering from syphilis, which in many instances is a chronic malady and improves little, or at all, no matter how active the treatment may be, until the patient goes away from home, when the hot springs are given credit for the improvement. At home the patient devotes a few minutes a day to getting well. Away from home he devotes twenty-four hours a day to getting well and directs all the energies which he has to that end.

In this connection, too, it is important to remember that the physician must always regard his remedies as having only a relatively small percentage of value in inducing recovery.

Too frequently both the physician and the patient consider the drug, or the remedial measure other than a drug, the main thing when in reality it is secondary, and often by administering full doses of drugs without regard to vital resistance more harm is done than good. This is particularly the case when drugs have power for harm as well as power for good, and what drugs have not if wrongly used?

A particular patient serves to illustrate this point. A physician wounding his finger during an operation is infected with syphilis, which is not recognized and goes untreated. He develops ordinary degenerative changes, albumin and casts in his urine, and loses as high as 4 to 5 per cent of sugar per day. In this instance he persisted in taking care of a large country practice, and when he was found to have a 4+ Wassermann, also insisted upon the use of arsphenamine intravenously, mercury by inunction, and that the starvation method of treating diabetes should be instituted in his case, entirely ignoring the fact that his vital resistance must be the chief agent in any improvement which might take place, since the condition of the kidneys contraindicated the use of arsphenamine and mercury and the rigid starvation plan of diet diminished his vital resistance to such an extent that without antisyphilitic remedies on the one hand and without vital resistance on the other he could not expect to improve. Possibly moderate doses of the iodides were the drugs that were best suited to his case with a modified dietetic treatment, combined with rest from toil and a life which tended to divert all his energies in the direction of repair and convalescence.

THE PHYSIOLOGICAL AND PATHOLOGICAL ACTION OF DRUGS.

Time was not so long ago when every drug which was employed by a physician was used with no other basis than that of empiricism, or in other words, it was used solely because a previous patient had seemed to derive benefit from its employment when in a similar condition. The majority of drugs may be said to be employed by this rule at the present time, and without doubt this rule must remain in effect with some force for all time, since experiments carried out in the laboratory, even when made upon man, cannot be the only guides for their administration in disease.

The factors of error in this method of employing drugs are very great, but it is not to be forgotten that the factor of error in applying animal experiments to man is also by no means small.

During the last half-century an increasing number of investigators have studied the influence of drugs upon animals and to some extent upon man. The results which they have obtained have usually been described as the "physiological action" of the

remedy. In many instances this physiological action has failed to explain the beneficial effects obtained by the administration of drugs to human beings when suffering from various conditions of disease. In other instances it has thrown much light upon the method by which drugs produce their effects, has corrected erroneous conclusions as to the manner of their action, and while not disproving their value has made us understand that the results were achieved by other means than those which were first considered certain.

A notable illustration of this is the drug alcohol, which was universally considered a stimulant until proved beyond all doubt to be a sedative, which proof did not nullify the conclusion that alcohol in certain cases is a useful drug, but showed that our conception of its action was erroneous, for it is now known that it is burnt up in the body and so gives energy, that it equalizes the circulation, and that certain parts of the body which may be unduly active are quieted, with benefit to these parts and to other tissues.

The difficulties of studying the pathological action of drugs are manifest. Even when the lower animals are artificially infected by diseases which commonly affect man, they by no means always react in the same way to the infecting organisms as does the human body, nor do their tissues when so diseased react identically with human tissue so infected as to drugs. Again, many of the lower animals are not susceptible to the diseases which affect man, and the number of instances in which an animal can be said to be naturally diseased are few and far between. Nevertheless, it is evident that along the line of the pathological action of drugs most of our accurate knowledge for the future must be obtained, and pharmacologists who will carry out experiments upon animals suffering from bacterial infection, or bacterial poisons, which they treat and study, by the administration of remedies used in human medicine, have a most important and fertile field before them.

A number of investigations of this kind have already been made. Somewhat along these lines MacNider and others have studied the reaction of the kidneys in conditions of disease artificially produced. The latest research of this nature which has come to our attention is, however, one which is reported in the *Journal of Pharmacology and Experimental Therapeutics* by Bush, who has contributed an article on "Drug Action as Modified by Disease Toxins." The title of the article has too wide a scope, since the only drug employed was "ouabain," and the bacterial poison was diphtheria toxin; the study being naturally limited, because of the well-known physiological action of ouabain, to the heart.

Bush concludes from his investigations that the heart is rendered much more susceptible to the action of ouabain by diphtheria toxin than it is in health, which conclusion is not only interesting in itself, but if confirmed by other investigations is of very great importance because there can be no doubt that many physicians, face to face with cardiac failure in a case of diphtheria, would unhesitatingly employ strophanthin or ouabain, a practically identical substance, or digitalis, a nearly related substance, with the hope of influencing the heart favorably, and if so employed in large doses because of the desperate state of their patient might by the increased susceptibility of the heart produce deleterious effects by the drugs with which they hoped to do good.

We do not think that this subject has been sufficiently investigated as yet to make it wise for the physician to withhold such stimulants under such circumstances, and we quote this research not so much to advise against the use of these cardiac stimulants in the presence of the pathological action of bacterial poisons as to emphasize the fact, to which we have already drawn attention, that this is a most important and fertile field in which the pharmacologist up to date has done little or nothing.

THE TREATMENT OF VESICAL CALCULI.

Because of the ease with which it is done, the short time required, and the avoidance of injury to all important structures, the suprapubic incision is to-day the popular method of approach in all surgical procedures requiring access to the bladder, and has in great measure replaced, even for the removal of calculi too large to be picked out by a grasping instrument guided by the cystoscope, the crushing and evacuation method perfected by Bigelow, though the latter, when skilfully used and as demonstrated in thousands of cases, is followed by a lower mortality than is attendant upon any form of cutting operation.

Indeed, litholapaxy is so little practiced to-day that even in many of the larger hospitals there will be found neither in the institutional armamentarium nor in the possession of a single surgeon attached to the staff crushing and evacuating instruments of the type proven safest and most serviceable.

The medical profession seems as subject to fashion in the choice of procedure as is woman in the choice of dress. The mobile kidney and the suturing in place were fashions now happily out of date. At present the extraction of teeth is considered a proper procedure for the cure of nearly all diseased conditions in other parts of the body. With the enthusiastic adoption of a given method not necessarily new older and more firmly established treatments are discarded, later to be taken up afresh, if they have virtue, by reactionaries against the new movement.

One distinguished specialist of San Francisco was in the habit of crushing and evacuating the calculi of some of his patients as they stopped at his office on their way to business. Moreover, he did it successfully in many cases. There are convincing clinical reports as to the applicability and safety of the procedure from all parts of the world. It is undoubtedly easier and quicker to cut than to crush, but mortality statistics still remain, even in the day when crushing and evacuation have fallen into the background, distinctly in favor of the crushing operation. From which it follows that analysis of 455 cases of vesical calculus in the Massachusetts General Hospital made by Barney (*Boston Medical and Surgical Journal*, Oct. 9, 1919) is not without its helpful lesson. He notes that 442 of these cases were in the male and that 67 per cent of them occurred between the fiftieth and eightieth years. The youngest patient treated by the lithotrite was two years old, and he recovered; the oldest eighty-eight years old, and he died. More than 20 per cent were recurrent; this percentage of recurrence being four times as great after lithotrity as after litholapaxy.

Barney considered his cases by decades. As having its bearing upon the present, the most interesting period is that including the cases from 1910 to 1919. Lithotrity was done 45 times and cystotomy 22 times. The mortality of lithotrity was 2.2 per cent as compared with 13.6 per cent for the suprapubic cystotomies. The latter remained in the hospital an average of twenty-nine days; the former an average of seven days.

The author urges that the lithotrite and the evacuator are very special instruments and that they require special skill for their proper use. In the hands of the rough or untrained general surgeon either implement, especially the lithotrite, may do great damage. Such an individual should certainly do a cystotomy rather than a crushing operation. Furthermore, there are certain definite contraindications to the use of the lithotrite even in skilled hands. Diverticulum of the bladder may make the performance of lithotrity exceedingly difficult, or even impossible; obstructing prostate should be treated as such, the stone being regarded as a secondary affair; very large stones which exceed the limits of the jaws of the lithotrite or which prevent sufficient distention of the bladder with fluid—these are among the chief contraindications to the crushing operation. Each case must be decided upon its own merits, and the surgeon

must decide whether a well-done suprapubic cystotomy is likely to produce more harm than a poorly done lithotrity and litholapaxy.

CANCER OF THE MOUTH.

Cancer of the mouth, which has for years been the bane of surgery, at last gives some promise of being successfully dealt with, even in those cases (rapidly becoming scarcer) in which the disease is well advanced before it is recognized, this result being achieved by a combination of methods rather than by an accentuation of a single one. Neither radium nor *x*-ray has until recent times given any large hope of accomplishing cure. A combination of the two with surgery, particularly that accomplished by means of the actual cautery, is giving better results than the profession had dared to hope for.

This treatment is based at least in part on the belief, strengthened by a great deal of experience, that radium and *x*-rays exert a selective destructive action upon the diseased cells—in other words, that the latter are more vulnerable to it than the normal tissues. In so far as the effect of this agent is exerted on the lymph vessels and nodes, it is not this selective action on the malignant cells, but the ultimate sclerosing action which prevents diffusion. The treatment in all its phases must be thorough and conducted by experienced men.

Bryant (*Boston Medical and Surgical Journal*, Oct. 9, 1919) records the fact that Boswell has related of his Johnson that as a matter of unvarying routine he devoted fifteen minutes every morning to prayers and attention to his bowels; it has not come down to us that he ever made any such appropriation of time for mouth requirements. The dentist becomes the master man in the great struggle to combat oral malignancy. Everybody should see the dentist once every six months. Since cancer of the mouth is six times more prevalent in men than in women, and since it is more rarely found in those who abstain, tobacco must be seriously considered. Alcohol and very hot drinks must also be regarded as causative agents. Pyorrhea is an irritating factor of the first rank, as are syphilitic lesions.

All expressions of a diseased mucous membrane of the mouth should be viewed with suspicion.

The history of the results of all forms of treatment of buccal malignancy constitutes the darkest page in the disconsolate and despairing record of cancer therapy. This pitiable record proves that the oral is the most malignant form of new growth. Murphy's series of reported cases proves the limitations of skilled surgery. The cases were taken early and at a time when the process was local or at least regional. These cases were submitted to radical skilled surgery, and 52 per cent died of the disease. Another report from the same worthy source, where there was some glandular metastasis, showed a mortality from cancer of 75 per cent.

That we get these cases late is evidenced by the fact that eminent physicians have died of the disease. But there are reasons why the mouth has become the treacherous cockpit of malignant sieges. The richness of this locality in blood-vessels, glands, and lymphatics and its nearness to vital structures make its treatment or removal extremely difficult. Surgeons have long most dreaded and have given the gravest prognosis in this area of malignancy. While operations in this locality have been most difficult, disfiguring and distressing from interference with the respiratory and masticating apparatus, recurrences have been most common. Surgeons now hesitate to operate on cases of malignant mouth disease, for its return seems almost inevitable.

New reports 21 cases of cancer of the jaw and cheek in which he used heat and radiation where there was no glandular involvement. Twelve of these suffered no return in six to eighteen months. He speaks of the results as encouraging, and concludes: "Much more is being accomplished than formerly." He also reports three cases of lymphangioma of the

tongue, and concludes: "It would seem that radium is a specific for angioma and lymphangioma, and its great value is that it gives such remarkable results in these conditions, which are not surgical."

The method of treatment which gives best results and the best promise for the future is a combination of the cautery or electro-coagulation, radium, the Roentgen ray, and surgery. The operator will not always find it necessary or feasible to use all these agencies in the same case. In the different severities and localities of the lesions in the mouth, experience will dictate his choice. The most dependable of this group is the massive tremendous dosages of Roentgen rays. The bulk or as much as possible of the cancerous tissue should be removed locally so that the radiation may be in close contact to the base of the evil tissue. The actual cautery or electro-coagulation is preferable to surgery for this purpose, because there is no bleeding or unnecessary loss of tissue and the cancer cells are not let loose into the lymphatics or the circulation. All this outgrowth of cancerous tissue should be thoroughly but slowly destroyed. If a large sensitive area is involved, ether will be found necessary. If any teeth are in the way or are involved they should be removed. Small soldering irons make a convenient cautery. Whether cautery or electro-coagulation is used, "a slow heat that gradually cooks the tissue is preferable." If the antrum is involved it receives the same treatment.

The sloughing resulting from this destruction of tissue clears away in from ten days to two weeks' time. This leaves a red healthy base to which radium is directly applied. Radium acts from point contact only and must therefore be accurately applied directly to the area to be remedied.

Externally there should be used the most massive Roentgen-ray cross-fire dosage that can possibly be produced. When the cancer involves the cheek or lower lip the metastasis into the submental and submaxillary glands is generally early. To check, control, and, at times, destroy these malignant and all-dangerous metastases and to accomplish the sclerosing of the innocent glands and lymphatics further out is the work of the deep Roentgen ray.

REPORTS ON THERAPEUTIC PROGRESS.

INLUENZA FROM THE CLINICAL AND THERAPEUTIC STANDPOINT.

In the *United States Naval Medical Bulletin* for October, 1919, HARE states that as statistical data concerning the epidemic of so-called influenza in the fall of 1918 are given in other articles in the same journal he does not attempt to deal with those aspects of the subject.

The dominant fact is that in the vast majority of cases the illness during the great epidemic was not the result of infection by one pathogenic organism, but was a multiple infection in which one of several organisms was the chief agent or in which all were approximately equally responsible. If the word "influenza" is used to indicate that this epidemic was simply due to the bacillus of Pfeiffer it is misapplied, for the symptoms were not those produced heretofore by this organism, and in many instances it was present in such small numbers as to be fairly considered a collateral infection of secondary importance. While the pneumococcus was constantly present, as it is in most human beings at all times, it did not, except in very rare instances, produce its characteristic pulmonary lesion or physical signs, nor did it produce the sputum of croupous pneumonia. The great number of cases suddenly taken ill prevented, to a great extent, the "typing" of this organism, but here again it may be said that if the pneumococcus was a predominant factor in any case it produced results widely different from any heretofore seen.

The physical signs of disease, the symptoms, and the lesions recognized at autopsy were much more those of the streptococcus hemolyticus than of any of the other associated organisms.

The breaking down of the blood, its discharge from any orifice of the body in a state of hemolysis, the extravasations, not exudations, into the pulmonary parenchyma and smaller bronchial tubes, closely resembled the changes caused by those poisons which, when introduced into the body, cause hemolysis, such as snake venom or potassium chlorate. His belief as a clinician, rather than as a laboratory worker, is that most of the fulminant cases, characterized by the putty-colored face and hands with mulberry-colored lips, were due to this germ, with the others acting as secondary invaders.

In some instances the smears of the sputum were almost entirely made up of the spirillum of Vincent, generally without lesions in the mouth, and it is interesting to note that when such was the case the daily use of 0.3 arsphenamin intravenously produced remarkably favorable results, as it did in other cases in which this spirillum was not demonstrated, although possibly present.

Hare does not discuss the physical signs commonly found, except to say that the most characteristic pulmonary sign was an area, usually posteriorly, in the middle area of the chest, of remarkably well-defined tubular breathing without râles, which area often speedily spread over a wide portion of the lungs, so that at autopsy it looked and felt as if filled with melted currant jelly rather than a croupous exudate.

It is a subject for regret that therapy seemed in many instances perfectly useless, probably because the poison of the disease so rapidly attacked the heart muscle and the muscular coats of the vessels that they were incapable of responding to stimulation. A large, voluminous, low-tension pulse in an artery so relaxed as to feel to the finger more like a pulsating vein was commonly met with, and in these cases it often happened that the heart seemed to beat vigorously for a time in an endeavor to fill relaxed vessels. Indeed, Hare saw many cases in which the apex beat was still forcible on palpation and the heart sounds loud, yet in which the patient was pulseless at the wrist.

The complete failure of digitalis in these cases led him at first to think that the preparation used was impotent, but subsequent trials showed that no form or preparation of the drug possessed any of its ordinary powers. Indeed, he saw many cases in which the end seemed to be hurried by its use. This is in accord with general experience in the sense that digitalis acts best for a tired heart in valvular disease, but often fails in the weak heart of acute infectious processes, particularly if associated with fever. The same statement is also true of strophanthus.

The drug which seemed to act best as a stimulant was caffeine alkaloid in doses of two grains three or four times a day as a rule. Whisky also seemed to do good, provided it was not pushed too hard and did not upset the stomach. Caffeine by unlocking reserve energy, and alcohol by being burnt up in the body, probably acted indirectly in those cases.

For the relief of the pains in the limbs and back, 2 grains of cinchonidine with 5 to 10 grains of aspirin seemed most useful, but they had no specific effect, and in the fulminant cases were not used or had no chance to do good.

Proctolysis with normal saline, or with glucose solution, was useful to provide fluid to the tissues, but had no definite effect otherwise.

The great rapidity of the respirations, the great restlessness and delirium of many of the severe cases, indicated the use of easily assimilated food to maintain energy. This was provided chiefly by the use of semiliquid breakfast foods, diluted with milk, to which taka-diastase or pancreatin was added to hurry the first stage of carbohydrate digestion. Hare believes this is a valuable measure.

None of the ordinary hypnotics possessed power for good in his observation in any safe dose. Delirium or excessive cough were best controlled by morphine or codeine in full doses.

Finally, the following observations made by him he believes to be correct. In addition to the great incidence of the disease in those between twenty and thirty years of age, red-haired or sandy-haired patients seemed to suffer the most, particularly if they were of the lymphatic type. Next to them came the very blond man, while negroes seemed partially immune. Of course, there were marked exceptions to this in the sense that dark-haired men sometimes suffered severely.

Another point of interest is that some cases were stricken and died in a few hours or in two days; others began moderately, and then without any apparent cause became fulminant after forty-eight hours or more; still others with temperatures as high as 105° on entrance speedily came to normal with little systemic symptoms or local lesions.

SCABIES.

RAVOGLI, in *Modern Medicine* for October, 1919, states in reference to the diagnosis that scabies is not easily recognized by the general practitioner, who usually refers the itching sensation to nervousness, or to vasomotor troubles. The patients are treated with internal medicines, with changing diet, but remain annoyed with the itching eczema, when with one or two local inunctions they can be easily cured.

It is not necessary for diagnosis to extract the acarus from the furrow, which is usually difficult, but the presence of the furrows will prompt the diagnosis. The interdigital spaces, the penis, and the nipples in the woman show furrows. In some cases furrows are not found in the hands, especially in individuals using much soap or chemicals.

The multiplicity of such lesions as papules, vesicles, pustules, and eczematous patches, scattered in the parts of the body where the clothes are more tight, helps in the diagnosis. In all these cases, although the diagnosis is not sure, there is good reason to suspect scabies. The best way is to treat them as scabies, and in a few days all symptoms will disappear. When the cause is removed, the acari have been destroyed, the itching subsides, and in consequence the eczema diminishes. Sometimes, especially when using very strong irritating ointments for the rapid treatment of scabies, eczema gets so bad that it needs to be treated as an after-effect of scabies. Sometimes the itching lasts for a long time, and only after prolonged treatment does it gradually disappear.

The rapid treatment of scabies usually causes great irritation. It has to be remembered that the acarus is in the skin, which is an organ of the body, and in killing the acarus the skin is not to be injured. The treatment takes from five days to one week, but during the treatment the patient can do some work. The eczema, an after-effect of scabies, takes sometimes two and four weeks to be entirely cured.

Many remedies are capable of destroying the acari; at the head of all is sulphur. Helleborus, tar, naphthol, balsam of Peru, coal oil—all form the base of different salves used to treat scabies; but if the applied remedies are not capable of breaking the furrows, dissolving the epidermis so as to reach the acarus, scabies may easily recur, for the reason that some acari have escaped destruction.

In his practice the writer has always found reliable the Wilkinson salve as modified by Hebra. The formula is as follows:

> Flower of sulphur,
> Oil of cade, ää 20 gms.;
> Green soap,
> Lard, ää 80 gms.;
> Pulverized white clay, 5 gms.

For a delicate skin Ravogli prefers the salve of Weinberg:

> Styrax liquid,
> Flower of sulphur,
> White clay pulverized, ää 10 gms.;
> Green soap,
> Lard, ää 20 gms.

In these salves there is green soap to

soften the epidermis, white sand to break the furrows, sulphur and tar to kill the acari. The salve produces very little irritation. The salve has to be applied from the neck to the feet, rubbing vigorously so as to break the furrows. One and a half ounces of salve is sufficient for one application. In prescribing according to the age, the sex, and the size of the patient, from four to six ounces of salve are ordered. The quantity is divided into three parts, leaving a small quantity.

The salve is rubbed strongly all over, and some one must help to rub the back of the patient, so that no place is overlooked. After the salve has been rubbed, the same underwear is used; nothing is changed. The patient in the morning can wash the hands and face so as to be able to go to his occupation. The rubbing of the salve is repeated for three successive nights. The patient is told not to take a bath until two days after the last inunction. Meanwhile the little salve left can be used in the evening for the hands, which, having been washed, are liable to contain some acari.

The patient may take his bath and wash thoroughly with soap and hot water two days after the last inunction. The reason is to wait until the skin is dry, the shrunken epidermis begins to exfoliate, and all other symptoms of irritation gradually subside. After the bath the patient has to change all garments, and the clothes have to be fumigated or sterilized, to be sure that no acari and no eggs remain.

After the bath some patients still complain of itching sensation; many claim that they are not free, and insist on making some more inunctions. This has to be prevented. The itching sensation is the last to disappear; excessive use of the salve will cause more irritation, and consequently more itching. To relieve the itching a carbolic lotion can be used, dabbing the parts once or twice a day.

Acid. carbolic,
Glycerin, ää 1 part;
Aquæ ros.,
Alcohol, ää 3 parts.
M. and use externally. Apply as lotion.

When the parts dry cover with starch powder.

If eczematous eruption should trouble the patient, then it is necessary to cover the places with benzoate of zinc salve, or with a mixture of zinc and calamine, so as to cure the remaining eczema.

EFFECTS OF THE INJECTION OF ADRENALIN IN "IRRITABLE HEART."

Wearn and Sturgis in the *Archives of Internal Medicine* for September, 1919, state that many opinions have been advanced as to the etiological factors underlying this condition, but few facts have been brought forward in their support. Thus hyperthyroidism has been held by some observers to be the chief factor, while many others regard it as at least a significant factor in the production of the symptom-complex.

In order to make the investigation of the question of the rôle of the thyroid gland more comprehensive, it was decided to employ at the same time the adrenalin test. Goetsch has reported that cases of hyperthyroidism give a very marked reaction to small doses of this drug.

The technique followed is the same as that used by Goetsch in studying the hypersensitiveness to adrenalin of patients with exophthalmic goitre. The patients remain at absolute rest in bed for a period of one hour. If there is restlessness or apprehension they should be reassured, and every effort made to obtain mental as well as physical quiet. At the end of the rest period control readings of the blood-pressure, pulse and respiratory rates are made at five-minute intervals. Also at this time a note is made as to the presence of nervousness, precordial pain, dizziness, palpitation, or any other symptoms which may be significant. Likewise the objective condition of the patient is observed, and it is recorded if any of the following signs are present: tremor of the hands, sweating, coldness of the hands, throbbing of the neck, epigastrium, or over the precordium, and pallor

or flushing. At the end of an hour's rest in bed the patient is usually quiet and has few complaints; the blood-pressure and heart-rate are normal, or there may be a slight tachycardia (in sharp contrast to the patient with exophthalmic goitre in whom a more marked tachycardia persists even when at rest in bed). Likewise after the rest period there is little to record from an objective or subjective standpoint. If this condition approaching the normal has not been attained then the control readings should continue further, for with nervousness, tremor, sweating, tachycardia, or possibly other prominent signs already present it would be difficult to judge the effect of the adrenalin. In a few patients the control readings of blood-pressure and pulse remained at a level slightly above the normal, but the injection of adrenalin was carried out after they became constant. In a number of patients venepuncture was done at the end of the rest period for blood sugar determinations, but when this or any other disturbing factor is introduced it is necessary that subsequent control readings be made, and these should agree with the preliminary readings before the test can proceed.

After satisfactory control readings have been made, 0.5 Cc. of a 1:1000 solution of adrenalin, freshly prepared, is injected deep into the deltoid muscle. In all of these tests the solution was made by adding one 3/200 grain of Parke, Davis & Co.'s adrenalin tablet to 1 Cc. of water, thereby making a 1:1000 solution.

After the injection five readings are made of the blood-pressure, pulse and respiratory rates at two- or three-minute intervals, and also at these times any change in the objective or subjective condition of the patient is noted. After the first few observations readings are continued at five-minute intervals until one hour after the injection, when ten-minute readings are made for a period of one-half hour, thus making the observation period one and one-half hours from the time of the injection. From their experience at Lakewood it would seem that the time of observation could safely be cut to one hour, as they have failed to observe anything of importance after that length of time.

A typical positive reaction manifests itself on the average of about twelve minutes after the injection by a rise in systolic blood-pressure, increased pulse-rate, and certain characteristic changes in the subjective and objective conditions of the patient. There may be restlessness, complaints of nervousness, precordial pain, palpitation, and frequently apprehension. Pallor or flushing may be present. A fine tremor is very characteristic, and while it usually only involves the hands it may become general and very marked, occasionally to the extent of shaking the bed. In a number of cases there was tremor of the eyelids. The hands usually become cold, and often there is excessive sweating, especially in the palms. In some cases there was a definite dilatation of the pupils, while in others little change could be observed. Pulsation was frequently very marked in the neck and epigastrium and over the precordium. The patient often states that he experiences about the same symptoms that he had previously noted after exertion. The conditions just mentioned are very characteristic, and when they are present a hypersensitiveness to adrenalin is easily recognized without the aid of the blood-pressure or pulse record.

The onset of the symptoms is usually simultaneous with the changes in blood-pressure and pulse, and the symptoms vary in intensity with the changes in them. In a study of seventy-one charts of positive reactions in all types of "irritable heart" the average systolic blood-pressure rise was found to be 24.5 mm. Twenty-five of these cases showed a rise of from 10 to 20 mm., twenty-six from 20 to 30 mm., sixteen from 30 to 40 mm., two from 40 to 50 mm., and in two cases the rise was over 50 mm., one being 52 mm. and the other 71 mm. The pulse pressure is increased in all of the positive cases, either the diastolic pressure remaining constant while the systolic pres-

sure rises, or what is more characteristic, the diastolic pressure falling during the height of the reaction and returning to normal with the drop in systolic blood-pressure.

The reaction to the intramuscular injection of a small dose (0.5 Cc. of a 1:1000 solution) of adrenalin has been studied in normal soldiers, and in a group of soldiers showing symptoms of so-called "irritable heart." Of twenty-six normal soldiers who had gone through the grill of army training in its severest form for fourteen months, not one gave a positive reaction as judged by observation of pulse-rate, blood-pressure, objective signs, or subjective symptoms.

Seventy-three patients with symptoms of "irritable heart" were studied. Their symptoms were of long duration and for the most part antedated their entrance into military life. Of this group about 60 per cent gave a reaction which definitely indicated a hypersensitiveness to adrenalin. We know that adrenalin has a selective action on the sympathetic autonomic nervous system. One may, therefore, naturally suggest that the symptoms and signs induced in the positive cases are the result of a hypersensitive sympathetic autonomic nervous system. A careful clinical analysis, however, of the patients showing positive and negative reactions has revealed no essential clinical differences between the two groups. One cannot state that the clinical condition of the patients who are sensitive to adrenalin depends in any way directly on the factors underlying the positive reaction. On the other hand, this is not at all impossible, and there is nothing to lead one to conclude that the factors causing the symptoms in the positive and negative groups are the same. It appears to be certain, however, that this group of patients is not good material from which to make a soldier.

Although all efforts were made to improve the physical condition of these men, not one of those who gave a positive reaction and only three who gave negative reactions were able to go to full duty. They were unable to stand the strain, and in addition their reaction to gunfire makes them all the more undesirable for full duty. They are not fit to fight, and even in limited service their value is questionable. This class of patients is not a true product of the war, for they are seen not only in military but also in civilian life. They are of the type who go from one outpatient clinic to another with complaints of nervousness, weakness, palpitation, precordial pain, and dyspnea. They are classed as neurotic or neurasthenic individuals and have usually been receiving medical attention for years. As a class they have assumed a new importance since their induction into the army. There seems to be a certain level of strain below which these people live without their symptoms, and their one effort in life is to keep below this level. Above it their symptoms appear and they break. This explains why they are found in the army as a class and not in civil life as such. In both places, however, they present a problem of no little importance to the internist and to the practitioner of general medicine.

A CASE OF DIABETES MELLITUS TREATED BY THE ALLEN METHOD.

FITZ and BOCK in the *Quarterly Journal of Medicine* for July, 1919, remind us that, according to Allen's view, the best established and most generally accepted theory of diabetes is that it results from deficiency of the internal secretion of the pancreas. As a result there is first a weakened function of carbohydrate metabolism, next a weakened function of protein metabolism, and finally, in severe cases, an imperfect metabolism of fat For treatment, Allen has turned to experimental diabetes. When about nine-tenths of a dog's pancreas is removed, the resulting condition may appear as a progressively fatal disease. If an attempt is made to keep the dog fat and to satisfy his large appetite, he goes steadily downhill for several months and dies in extreme cachexia. On the other hand, the glycosuria can be stopped by fasting, after

which the animal can be placed on a low diet insufficient to cause the reappearance of sugar in the urine, but which will support life almost indefinitely. Such an animal is thin, but strong and lively, with no cachexia and no sign of downward tendency.

Allen's treatment for patients is analogous. The first step is to fast the individual until glycosuria ceases. When the fasting patient has been sugar-free for twenty-four or forty-eight hours he is fed cautiously. Usually the first food given after the fast is carbohydrate in the form of green vegetables, and this is increased in regular amounts day by day until a trace of glycosuria appears. The purpose of such a programme is to learn the carbohydrate tolerance and to clear up the last traces of acidosis. After this period protein is added until the patient shows glycosuria or reaches a safe protein ration. Fat is somewhat less urgently needed and can be added as conditions seem to indicate.

In subsequent treatment the attempt to put weight on the patient according to the time-honored traditions of diabetic treatment is discarded. The most severe diabetic may be thin and weak because he cannot metabolize enough food to be strong or well-nourished, but as long as his weakened pancreas is not overtaxed, and as long as he remains a glycosuric, with a normal blood-sugar concentration, he seems able to retain such weight and strength as he has for at least a considerable period of time. Any attempt to build him up with any kind or quantity of food beyond that which he is able to metabolize perfectly, however, seems to hasten a fatal result. Therefore his diet is restricted to his disease and he is kept sugar-free with disregard for his body weight or appearance.

On the whole the main features wherein the outlined treatment differs from the previously established methods may be summarized under three headings. The first two represent differences merely of degree, in that the treatment is more radical than the old, namely: first, an initial fast sufficient to clear up glycosuria in any case and usually one or two days longer; second, a subsequent diet to keep glycosuria and acidosis permanently absent, with as many interspersed fast days as may be necessary for this purpose. The third feature represents differences not in degree but in kind, and is diametrically opposed to the prevalent teachings; it opposes the idea that the diabetic should be kept at the highest possible level of weight and strength and that gain in weight is synonymous with improvement; it substitutes for this the plan of keeping the severest diabetics intentionally and permanently at a sufficiently low level of weight and metabolism in the belief that return of symptoms and downward progress is thus prevented. Whatever the ultimate outcome of a given case, two conclusions seem justified by present knowledge: The treatment removes glycosuria and acidosis more quickly and surely than has been the practice heretofore, and patients do better when glycosuria and acidosis are removed than when they are allowed to continue.

NOTES ON USE OF OBSTETRICAL FORCEPS.

Writing in the *Boston Medical and Surgical Journal* of October 30, 1919, KIRKHAM says we must remember axis of inlet is at a different plane than is the axis of outlet and that the axis of whole pelvis describes a part of circle, with the symphysis as the center. Examination of patient should be made before forceps are applied. The position of the child and the exact application desired should be visualized before the actual introduction of forceps. He urges that we take time to make application and that we use no force in the introduction of blades, all movements and manipulations must be gentle, and all traction should be intermittent and under the conrtol of operator.

If the head is above the brim, at a high level in pelvis, or in a posterior position or other position which will make difficult

forceps probable it is well to remember that time spent in locating the exact position and obtaining a good application of blades will save time in the end, resulting in less danger to mother and child.

Kirkham also insists that when in doubt as to findings or application, it is wise to stop and try again or send for assistance, and not to run risks when lives are at stake.

NEPHRITIS AND KIDNEY FUNCTION.

MacLean and DeWesselow in the *Quarterly Journal of Medicine* for July, 1919, state that the active treatment of acute nephritis reduces itself largely to the treatment of symptoms. The principle is generally accepted that a low protein diet is indicated in the early stages, especially in cases in which there is a retention of nitrogenous products. Very often this low proetin diet is regulated according to the amount of protein appearing in the urine, so that in certain cases it is the practice of medical men to persist with it for long periods. Often milk is made use of in this connection, and it is not infrequently forgotten that milk is a form of food comparatively rich in proteins. On general principles it is probably correct treatment to give low diets, especially as regards protein, during the early stages of the malady; but it is by no means certain that protein does any harm, especially during the subacute and convalescent periods of the disease. Though it is often enough inferred in the literature that an increase in protein intake tends to raise the total percentage of protein in the urine, they have obtained little evidence of this in their cases. In the urine of several patients examined by them, little or no increase in the urinary protein could be ascertained after protein meals, and they are inclined to think that if this alleged increase in albuminuria after ingestion of protein takes place at all, it is a much rarer phenomenon than is generally supposed.

On physiological grounds it is difficult to understand why protein, which according to modern teaching is hydrolyzed in the intestine and resynthesized by the tissues from the amino-acids in the blood, should increase the protein of the urine. No doubt, it is a difficult question to decide whether or not a large protein meal immediately increases the blood protein, but if it does so at all it can only do it to a very slight extent if we accept as correct the modern ideas on protein metabolism. Indeed, so far as the evidence goes, it would appear that blood protein is only slowly built up, just as is the case in other tissues. The point to be noted is that protein is essentially different from such a substance as sugar, which is absorbed as such into the circulation, and tends to increase directly the blood sugar concentration.

Further, there is no evidence that protein causes any injurious effects in the type of renal disease in which there is no tendency to nitrogenous retention—the hydremic type. Indeed, we really do not know whether protein in ordinary amount does harm even in azotemic cases where there is a tendency to nitrogenous retention, but in the present state of our knowledge it seems wise, on general principles, to enforce certain restrictions as regards protein in such patients. It must, however, be borne in mind that patients suffering from subacute nephritis should have a sufficient amount of food, for the detrimental effect of an insufficient diet retards progress. In the two different types of nephritis, however, modifications in the dietetic treatment are indicated. With regard to water it is the custom of McLean and DeWesselow to give unlimited amounts to the azotemic type of patients during the subacute stage, and even to encourage drinking. In the hydremic variety the intake of fluids is naturally kept moderately low.

In the azotemic type of nephritis they have proceeded on the principle that a low diet is indicated during the acute stage, and that this should be followed, at least for some time, by a diet of reduced protein content but rich in carbohydrates and fats. Sometimes such a diet may give rise to digestive disturbances, but this is rare.

After a month or two, depending on the severity of the case, all their patients were put on ordinary hospital diet.

In the hydremic case, after the acute stage is over, the conditions are entirely different. Here there is no tendency to retain nitrogen, and no apparent reason exists why protein should not be given in the usual amount. Since this type of case corresponds to the chronic parenchymatous variety, they have adopted in their hydremic cases the method of dietetic treatment recommended by Epstein in parenchymatous nephritis. In this condition, in which one of the most trying symptoms is pronounced edema often accompanied by ascites, Epstein found that feeding with a diet of very high protein content often resulted in a decrease or removal of the dropsy. This beneficial result he ascribed to an increase in the protein of the blood plasma. In these cases there is generally a large amount of protein lost in the urine, and Epstein concluded that this drain of protein resulted in a low protein concentration in the blood which lowered the plasma osmotic pressure to such an extent that water escaped from the blood-vessels into the tissues. The increased protein diet, by raising the plasma protein content, augmented the power of the plasma to retain water in the blood-vessels and so prevented an accumulation in the tissues. The water retained in the blood was of course thrown off by the kidneys instead of being passed on to the tissues.

That a high protein diet often results in removal of the dropsy in chronic parenchymatous nephritis is certain, but the cause of this is not very easy to ascertain with certainty. While increase of plasma protein may be a factor in some cases, it is certainly not the essential one, for they have seen a case, in which the edema and ascites were exceedingly severe, clear up in two months without any increase of the protein in the blood.

Concerning the effect of urea in causing diuresis in nephritis it is to be recalled that since the protein content of the plasma of the patient tends rather to decrease than increase, it is certain that, in some instances at any rate, Epstein's explanation does not hold. What then can be the cause of the marked diuresis by which the water-logged cavities and tissues are drained? They are inclined to think that the explanation lies in the increase of blood urea consequent on the enhanced protein diet. Urea acts normally as a powerful diuretic in cases where there is available fluid for excretion, and has been credited with results in parenchymatous nephritis where other diuretics have failed to act. From an initial value of 27 mg. per 100 Cc. of blood the urea rose in a case under their care to a maximum of 81 mg., being generally in the neighborhood of 60 mg. Now this amount of urea should be sufficient to stimulate marked diuresis, and in order to test this they tried the effect on a similar case of continuous doses of urea given by mouth. Here, again, the quantity of urine was more than doubled, though other diuretics had little effect. Unfortunately, the patient refused to continue taking the urea owing to its unpleasant taste and its tendency to cause sickness; it was obvious, however, that the treatment had resulted in a reduction of the dropsy.

In still another patient suffering from the hydremic variety of war nephritis with persistent edema, a slight pulmonary complication ensued accompanied by a temporary urea retention in the blood. Here the urea rose from 24 mg. to 57 mg. Three days afterwards a copious diuresis occurred, and continued until the blood urea content reached normal, the result being that the original troublesome edema was much decreased.

This effect of urea probably explains the cause of the marked diuresis so often seen in acute nephritis after the first few days. In these cases there is a tendency for the retention of the urea, water, and other ingredients. The urea content of the blood increases and the tissues contain an excess of water. Soon the kidney recovers somewhat from the original inflammatory

invasion and the renal cells begin to functionate more normally. Here, then, we have all the conditions making for a profound diuresis—an increased blood urea content, excess of water in the tissues, and a recovering kidney. The consequence is that in ordinary cases diuresis goes on until the edema disappears, or until the blood urea returns to its normal level. Indeed, it would seem as if the storing up of urea acts as a provision of nature to insure the rapid removal of retained fluid.

In chronic parenchymatous nephritis there is no tendency to retain urea while the patient is on an ordinary protein diet, but on a much increased diet, such as that recommended by Epstein, the blood urea concentration is appreciably increased, with the result that diuresis follows. Whether or not this is the full explanation of the phenomenon, there is little doubt that it plays an important part.

If we accept the teaching that a large amount of protein food is indicated in parenchymatous nephritis with dropsy, we are confronted with the apparently anomalous principle that in cases in which there is much albuminuria (nearly always parenchymatous cases) the larger should be the amount of protein given in the food. This is, however, quite reasonable on various grounds, since the actual daily loss of protein by the urine is very appreciable and some attempt should be made to compensate the body for this loss. Also, if the increase in blood urea is the chief or only factor in the causation of diuresis, it is much more pleasant to induce the condition by means of protein food than by the more direct but unpleasant method of giving urea by the mouth.

The withholding of salt is also of much value in certain mild hydremic cases, for in several of their patients edema persisted as long as the ordinary amount of salt was permitted in the diet, but rapidly subsided in cutting off salt. In cases of severe parenchymatous dropsy, however, a so-called salt-free diet often fails to have any appreciable effect.

THE PHARMACOLOGY OF LOCAL ANESTHETICS.

EGGLESTON and HATCHER, in the *Journal of the American Medical Association* of October 25, 1919, state that the employment of artificial respiration in combination with stimulation of the heart by the immediate intravenous injection of adrenalin enabled them to resuscitate the majority of cats experimented upon after the rapid intravenous injection of doses of the local anesthetics up to twice the average fatal dose. Since the heart had stopped in most of the cats, it was necessary to practice massage of the heart in order to bring the adrenalin into contact with it. The success of this method of resuscitation depends on the rapid destruction of the local anesthetics, whereby the excess administered is promptly eliminated if the circulation can be maintained for only a few minutes by the stimulation of the heart with adrenalin. But even with such stimulation, and when it is evidently recovering, the animal will die of respiratory paralysis unless the center is supported for a few minutes by artificial respiration.

The success of these measures, in which the brief stimulation of the heart played the most important part, led them to try the effects of previous stimulation of the heart by the administration of a dose of ouabain (so-called crystalline strophanthin). They then administered doses of the local anesthetics up to twice the average fatal dose, and employed artificial respiration to tide over the period of respiratory paralysis. By these measures, cats usually survived doses of the anesthetics up to one and three-quarter times the average fatal dose.

They believe, therefore, that if the circulation and respiration can be maintained for even a few minutes, the rapid destruction of the local anesthetics by the liver will care for amounts considerably in excess of those which are usually fatal. The close analogies between the behavior of man and cats to toxic doses of the local anesthetics, and the fact that man also recovers rapidly from the effects of non-fatal doses, suggest

that he also accomplishes their elimination or destruction in his liver, and it seems highly probable that the use of adrenalin and artificial respiration will prove effective as resuscitative measures in many cases of acute poisoning in man. It is, however, to be remembered that serious intoxication has been seen in man following extremely small doses of the local anesthetics, suggesting the occasional existence of a marked degree of hypersusceptibility; and in such cases doses which are relatively small, as compared with the average commonly employed, may actually be several times the minimum which would be fatal in the particular individual, so that even the most effective resuscitative measures may well fail under such circumstances.

While cardiac massage cannot be carried out so efficiently in man as in the cat, it can be performed sufficiently to cause the greater part of an intravenous injection of adrenalin to reach the heart; and several satisfactory methods are available for carrying on artificial respiration in man. These measures can be applied without loss of time under most conditions, and they certainly seem to be the most effective means at our disposal for saving life after the development of symptoms of acute intoxication by the local anesthetics. Since acute poisoning in man occurs when least expected, those who frequently employ these local anesthetics should always be prepared to apply the three resuscitative measures of intravenous infusion of adrenalin, artificial respiration, and cardiac massage. All three should be used in rare instances.

Finally, in order to diminish the likelihood of intoxication from the subcutaneous injection of the local anesthetics—especially those which are the least toxic, viz., apothesine, alypin, beta-eucaine, procaine, and tropacocaine — in man, adrenalin should be added to their solutions as a routine, because by delaying their absorption it renders it more probable that the destruction by the liver can keep the amount present in the circulation at any one time at a point below that sufficient to cause intoxication. The use of adrenalin also has the further advantages of prolonging the anesthetic action of a given quantity of the drug and of reducing the amount required for anesthesia by permitting a larger proportion of the dose injected to remain in contact with the tissues to be anesthetized, and by maintaining the contact for a longer period of time than when the drug is injected alone.

NERVOUS HEADACHES.

HERNAMAN-JOHNSON, in the *Practitioner* for October, 1919, states that the true nervous headache is found, for the most part, in the overworked professional or business man or woman. It is often associated with a general "run-down" condition, and with some degree of anemia. On the other hand, patients may look fairly well, and state that they feel perfectly fit on the days when they have no headache.

One of the peculiarities of this type is that it comes on without apparent reason. A favorite time is 2 to 3 o'clock in the afternoon. Although "nervous" headache is often diagnosed, when, in reality, there exists some specific cause, yet the opposite error is quite as frequently made, and the trouble is ascribed to eye-strain or to "biliousness" or constipation. The patient goes to an oculist, who may or may not find some refractive muscular error; but, in any case, the wearing of glasses fails in itself to relieve the condition. Dieting, digestive mixtures, and various purgatives are all tried in vain, although such is the "freakishness" of this species of headache that the patient is often convinced—for a time—that some one of the above measures has relieved him. Then, after perhaps a week of most careful attention to diet and intestinal cleansing, comes a succession of "blinders," which drives him almost to despair. He is advised to go away for a few days' holiday. If it is a success as regards amusements and weather, his headaches will vanish, and perhaps not recur for some weeks. But if matters go awry while he is away, little or

no benefit will accrue. The patient comes to believe that he must be prepared to reckon with his headaches all his life, and that all he can do is to ward them off with a holiday when they show a tendency to become overpowering.

Their medical advisers often give advice to these patients as follows: "A few days is of no permanent use to you—you want a three months' rest and change." To many sufferers this is impossible; or, at least, would cause so much financial worry as to negative any possible good. In fact, until the war broke out, one seldom saw the experiment tried. But the Conscription Acts took many such men and gave them an open-air life free from worry. All their symptoms vanished, and they became pictures of health. But, in many cases, a return to pre-war conditions has caused a recrudescence of the symptoms within a few weeks; so that one must hesitate to promise a patient that even a long holiday will enable him subsequently to carry on his original profession or business free from headache.

There is only one therapeutic agency which will enable the sufferer to remain at work for long periods in comparative comfort—electricity. For this purpose local applications should be made to the head and back.

The most simple procedure is to use a mild high-frequency discharge from a vacuum electrode over the painful parts of the scalp and the back of the neck. This should be done for a few minutes daily for several days.

In severe cases of long standing, cerebral galvanism must be used as well every other day for five or six weeks. The positive pole should be over the forehead, the negative at the back of the neck—the reverse of this sometimes makes the headache more intense. The question of polarity is of far more importance (when the skin is unbroken) than that of the particular solution used to moisten the electrodes.

Interrupted currents should be avoided in such cases so far as the head is concerned, but they are useful for the back. These patients are often round shouldered and inclined to "slouch"—the production of rhythmical contraction of all their back muscles, especially those which brace the shoulders, is of great benefit to them.

A mild case may be relieved for six months by a fortnight's treatment. A serious case will require several weeks to start with, and subsequent short courses every few months. He will still need occasional holidays, but, so far as the electrical applications are concerned, he can carry on his business or profession while receiving them.

CAMPHOR IN PNEUMONIA.

In the *China Medical Journal* for September, 1919, BRYAN states that camphor has been used in Europe and by many doctors in America, but as he understands it they have employed it merely to stimulate the heart. His idea is different. It should be used for the purpose of overcoming the toxemia and killing the pneumococci. For a heart stimulant he uses digitalis usually after the third day. He says he has cured twelve consecutive cases.

As soon as the diagnosis of lobar pneumonia is established he gives an adult 2½ mils of a solution of camphor and olive oil. Each mil of the solution contains 2½ grains of camphor. He usually uses a glass syringe holding two mils and pulls the barrel out as far as possible, which gives about 2½ mils, making approximately six or perhaps seven grains of camphor every four hours in the daytime; the patient gets four doses every day. If the patient is not seen until the fourth or fifth day, or if he is in a very bad way, the hypodermic injections may be continued for one or two nights. Poisoning is not likely to ensue. If the case is seen late and the pulse is weak, ten drops of the tincture of digitalis are given by mouth three times a day and once at midnight if necessary, though the fourth dose if repeated is likely to cause diarrhea.

About the third day after the camphor

has been given the rusty sputum is replaced by whitish and mucopurulent sputum and the temperature begins to fall; it is normal by the fourth or fifth day, but the patient is comfortable after the second day.

Bryan never gives morphine for the relief of the pain of pneumonia. He thinks it dries up the secretion of the lungs and increases the temperature; instead, he applies a hot-water bottle to the affected lung, and gives ten grains of sodium salicylate every four hours during the daytime, for one day or maybe two days.

In giving camphor by hypodermic injection, one dose should be put in the right triceps; the next in the left; the next in the left triceps of the arm; the next in the right quadriceps exensor of the leg above the knee, say the middle third either on top or the outer side, never on the inner side of the thigh. There is no objection to injection in the buttocks. It is best to lift up a fold of skin and insert the needle so that it will go through the skin, fascia, and fat, and distribute the oil between the fat and the muscle. It is the needle plunging into the muscle that gives pain and causes a lump to appear afterwards. In women and fat people the skin is difficult to pick up this way.

The camphor is first dissolved in ether or chloroform and then mixed with the best grade of olive oil, not cottonseed oil. It is then poured into half-ounce bottles and sterilized by boiling by boring holes in a small wooden stand and putting in a dozen bottles at a time and settling them in a water bath. This method prevents the evaporation of the camphor. Cotton plugs are put in the mouth of the bottles and the corks dropped into the boiling water. When the sterilization is complete, at the end of one-half to one hour, the cotton is removed, and the sterile corks quickly inserted. The bottles remain sterile indefinitely. A teaspoon is flamed before pouring the oil out for use. The syringe and needle are sterilized by simply filling with alcohol and rinsing out, so one does not have to wait for it or for the oil to cool; the hypodermic injections can, therefore, be given in a few minutes. Bryan advises the smallest needles, and continues the treatment for two or three days after the temperature drops to normal.

[Olive oil will not pass through very small needles, but almond oil will.—Ed.]

THE ACTION, USE, AND ABUSE OF PITUITRIN.

Schulze in the *Journal-Lancet* of November 1, 1919, calls attention to several points that are not given the prominence they deserve, or perhaps are not even mentioned in the literature on the subject. The age and parity of the parturient woman must be kept in mind. Advancing years and repeated pregnancies and labors, especially at short intervals, produce degenerative changes in the muscle fibers of the uterus. As a consequence these uteri do not stand the strain of labor. Either they do not exert themselves sufficiently to terminate labor spontaneously or they may rupture. In either case the myometrium is not up to par, and the administration of pituitrin would be an unusually hazardous procedure.

He recalls the case of a primipara slightly over forty years of age in whom the fetal head would not engage. She was examined by two of the attending physicians, and they gave it as their opinion that the head would engage in time; at least they saw no reason why it would not. When the os was fully dilated the membranes were ruptured manually, and labor was allowed to continue. She labored long and apparently hard. Suddenly the fetal heart was lost, and a craniotomy was done. One of the staff men said that even to the end he could see no reason why engagement did not take place, and gave it as his opinion that, owing to the age of the patient, the uterus had lost its tone, owing to these retrogressive changes, and the prolonged labor produced fetal death.

Another case was that on a para-XI over fifty years of age in whom all the

previous labors had been spontaneous and easy except the ninth, which was a forceps delivery. She, too, labored long and apparently hard without engagement of the head, and finally the uterus underwent spontaneous rupture. Here, too, the opinion was stated that, owing to the age and parity of the patient, the uterine muscle had undergone degenerative changes, which produced weakness and favored rupture.

Watch the condition of the patient's bladder.

On several occasions he has seen the fetal head fail to engage because the brim of the pelvis was partially filled by a tumor mass furnished by a distended bladder. Determine the condition of the anterior lip of the cervix. It is often caught under the symphysis of the pubes, and furnishes a tumor of no small dimensions, hindering the progress of labor in a mechanical way. Not only will necrosis take place from pressure, but, when in this position, it is unable to share in the normal retraction of the lower and thinned segment of the uterus, and favors rupture. Administration of pituitrin in any of these conditions adds a new and serious risk.

There is another matter concerning which we will have to change our ideas or resort to new and different terms to convey our thoughts. It pertains to the question of so-called "primary" and "secondary" inertia. Inertia may be defined as lack of power of the uterine muscle to contract effectively, and, obstetrically speaking, is of two kinds: That form which may be due to impaired innervation, endometrial degenerative changes, either primary or due to pathologic changes in the adnexa, and which we have called "primary." Whatever the cause, it is inherent in the organ itself. All inertia is essentially primary. There is that other form which we have tried to describe by the term "secondary inertia," and we see it in that uterus which has worked long and hard trying to expel its contents, but has been unable to accomplish it and has been forced to cease its efforts. This uterus is exhausted. Would it not be better if we reserved the word "inertia" to describe the former condition, and the word "exhaustion" for the latter, and then in a measure appropriate treatment suggests itself? The former condition is one of laziness, and calls for stimulation; the latter is one of exhaustion, and calls for relief.

THE ENERGY CONTENT OF EXTRA FOODS.

BENEDICT and BENEDICT, in the *Boston Medical and Surgical Journal* of October 2, 1919, state that while at first sight it would appear to be utterly immaterial in a total 24-hour caloric intake of from 2000 to 3000 calories whether or not one ate one caramel or whether or no 50 to 60 calories were taken in the form of this or that extra food, it is clear that even one doughnut is not to be neglected in such a computation, that the contents of a can of sardines are not without significance, and it should be thoroughly borne in mind that even one individual caramel plays a distinctly important rôle in the daily energy quota. When one realizes that a single caramel, a nougatine, or a penny's worth of candy may furnish sufficient calories to supply the extra heat needed for walking a mile or more, their energy content appears to be more worthy of consideration To take a "constitutional" of two miles is a religious factor in the life of many individuals. That the extra energy required for this exercise may be derived from one-half of a large doughnut will certainly be news to many. The ingestion of three medium-sized olives appears to be insignificant, and yet to increase the caloric output of the body by an equivalent amount of heat it would be necessary for the average man to walk half a mile. For a man of average weight to walk from the bottom to the top of the Washington Monument would require an extra heat production of 80 calories. The energy expended in this seemingly considerable bit of exercise may be completely replaced by the consumption of less than one-half a doughnut, or six unsalted walnuts, or five large olives, or

four pretzels. In the light of these comparisons it is illogical to disregard the energy content of these extra foods.

Finally, the caloric needs of the growing boy or girl, as reflected in their seemingly insatiable appetites—a common household experience—should not be underestimated. A recent analysis of the weights of children implied that every effort should be made to have children somewhat over rather than under weight. The common raids upon the kitchen pantry of the small child, if not of sufficient frequency to upset digestion, are not physiologically unsound. The active healthy child has usually an extraordinarily good digestion and needs large amounts of food.

THE DOSE OF COLCHICUM IN GOUT.

MATTHEWS in the *British Medical Journal* of August 30, 1919, states that most authorities agree that colchicum is a specific in gout. Martin, he thinks, teaches that "the only drug of any use in gout is colchicum, and the only preparation of colchicum of any use is the wine." His own experience leads him to suggest that the tincture is also useful if given in suitable doses. But the most effective preparation of colchicum is the acetic extract.

He suggests that the B. P. dose of the extract—namely, ¼ to 1 grain—is altogether too small to be of any use, and that, since the acetic extract (B. P. 1885) is no longer official, the value of the extract has been lost sight of. The average effective dose of the acetic extract is not ¼ to 1 grain, but 2 to 6 grains. This, so far as he is aware, has proved a perfectly safe dose in the following prescription:

℞ Pulv. opii, gr. j;
Pulv. ipecac, gr. j;
Pulv. cambog., gr. ij;
Pulv. aloes, gr. iv;
Ext. colchic. acet., gr. viij.

Misce; fiat pil., div. in 4. Mitte 12 or 24.

Dose: One pill three times a day, or two at night and one in the morning.

He has known many instances in which three pills (and by persons accustomed to take them even four) have been taken for a dose (= 6 and 8 grains of the extract) without any noticeable result other than that desired. But the average dose above mentioned rarely, if ever, fails to relieve rapidly and completely all the symptoms, especially in acute cases.

OVARIAN SECRETIONS—ITS RELATIONS TO THE HUMAN FEMALE ECONOMY AND THE PRACTICAL OVARIAN ORGANOTHERAPEUSIS.

In *American Medicine* for September, 1919, OGINZ states that in discussing the therapeutic value of the ovarian extracts he wishes to emphasize the fact that the combinations of ovarian substances together with chemical therapeutic measures in common use prove of invaluable aid in combating the various symptoms which arise through ovarian dysfunction.

Before we can prescribe intelligently for patients, it is absolutely essential that we eliminate all pelvic inflammatory diseases in their active state, new growths and the various uterine displacements. We may gain valuable information by taking a complete history, particularly as to age, occupation, social standing, marital relationship, a premenstrual history to determine the existence of any congenital malformations or displacements of the organs, also a postmarital menstrual history as to whether the patient is suffering from any form of menstrual derangement, paying particular attention to pain in reference to the menstrual cycle. The postpartum and postabortive states, whether the patient had some form of sepsis, or any remaining after-effects, must also be taken into consideration.

Having ascertained the above data it becomes necessary to make a pelvic examination, in order to exclude pathologic conditions, as the ovarian extract treatment will positively fail in their presence. We must remember that it is our object to replace only normal ovarian hormone activities, the lack of which is producing functional symptoms, and only after the

correction of such pathologic conditions as uterine displacements, new growths, and inflammatory conditions, if symptoms still persist, should organotherapy be tried.

In cases in which the ovaries are destroyed by disease, removed by operation, or inactive from congenital maldevelopment or physiologically reduced by menopause, ovarian extract, two grains twice daily, together with a suitable tonic, nerve sedative, or proper stimulant will give encouraging results. In conditions of infantilism it favors the further development of the reproductive organs and the establishment of their activities.

In dysmenorrhea and in disturbances preceding menstruation, such as nausea, vomiting, headaches, dizziness, etc., corpus luteum in doses of two grains twice daily in conjunction with a stomach sedative during the week prior to the onset of the flow will relieve these symptoms. In cases of amenorrhea or delayed menstruation of girls and women, corpus luteum together with a suitable tonic and improved hygienic surroundings will tend to establish a normal flow. The value of ovarian extract in small doses in menopause has been sufficiently demonstrated in every one's experience, but he impresses the importance of combining the ovarian extract with a nerve sedative (in such cases). Hyperemesis of pregnancy has been successfully combated with the intramuscular injection of one mil of corpus luteum daily, for not more than twelve days, some cases responding to four doses. Some clinicians report a few favorable results in the treatment of sterility by the use of corpus luteum. Changes of the skin of the face, particularly about the chin, most evident before menstruation, have been treated with two grains of ovarian extract twice daily, one week before onset of the period. In women past the menopause for several years, who suffer from pruritus (not due to diabetes), senile vaginitis, vulvitis with remote changes, instability, flushes, etc., the ovarian substance in conjunction with local treatment and suitable nerve sedatives has been of benefit. Contraindications for the use of the extracts are mainly acute inflammatory pelvic conditions, pregnancy, and hypersexual excitability.

Oginz concludes that the value of ovarian therapy is seen in the treatment of patients suffering from functional deficiency or ovarian internal secretion; following in importance is its value in menopause cases, and in young women with functional amenorrhea. Other types of cases in which ovarian therapy is surprisingly efficacious are represented by patients suffering from deficient circulation of blood to the external genitals, such as pruritus, kraurosis, furunculosis, and other affections of the vulva in elderly women.

Thus the beneficial effect of ovarian organotherapy, it is safe to say, has passed the stage of theory and speculation and it is now an established fact.

A PREVENTIVE THERAPY FOR CERTAIN MIGRAINES.

In an editorial the *British Medical Journal* of August 30, 1919, calls attention to the fact that a preventive therapeutic measure for certain cases of migraine has recently been described by Pagniez, Vallery-Radot, and Nast. Three years ago they recorded a case of recurring giant urticaria, of alimentary origin, which they cured by advising the patient to eat a small quantity of the particular noxious article of diet an hour before a meal. They applied this principle to migraines which have for years resisted other forms of treatment. Five cases are described. One, a man aged 34, had had migrainous attacks since 10 years of age, usually twice a week. He had always had great difficulty in digesting meat and eggs. A cachet of half a gramme of peptone, half an hour, or one hour, before the two chief meals every day for a fortnight was taken. He had no attacks during this period nor for six days afterwards. Then a return to the treatment controlled the attacks. They reappeared some months after cessation of peptone

treatment, and were then rapidly controlled by it again. There was in this case, and also in the others, a great coincident improvement in digestive power. Two of the patients took cachets containing peptone half a gramme, calcined magnesia a quarter of a gramme, and powdered licorice q. s. The writers found that in some cases of migraine the method fails entirely. At present it is unknown what are the special indications for or against it.

THERAPEUTIC ASPECT OF BLOOD TRANSFUSION.

UNGER, in the *Journal of the American Medical Association* of September 13, 1919, states that there is a far greater number of reactions following transfusion with citrated blood than with unmodified blood. This is due to alteration in the blood cells. The platelets undergo early coagulative changes. Sodium citrate acting as a harmful foreign substance renders the red cell more fragile and more easily hemolyzed. This undesirable result is of especial importance in hemolytic diseases.

Transfusion of whole unmodified blood is the procedure of choice when blood is required as a tissue. When it is wanted merely to replenish an impoverished circulation with an adequate supply, citrated blood may serve as a substitute.

For the selection of donors, a simplified and rapid microscopic method is desirable.

Repeated withdrawal of blood for transfusion may produce in the donor an intense secondary anemia with an increase in the leucocyte count. In the illustrative case reported, sixty transfusions were performed within a period of six and one-half years, with the removal of fifty liters of blood.

The onset of hypertransfusion is evidenced by the patient giving vent to short, sharp coughs. This signal has been of decided value as a warning of impending danger. The giving of more than about 200 Cc. of blood after the occurrence of "the signal cough" may prove fatal.

Transfusion yields moderately good results in infectious and debilitating conditions. The best results are obtained in toxemias, in shock, in cases of hemorrhage, and in diseases of the blood, in which it is frequently of life-saving value.

ADRENALIN IN BLACKWATER FEVER.

In the *British Medical Journal* of August 30, 1919, ROBERTSON states that the use of adrenalin chloride in blackwater fever was first suggested by Barnes, a retired government medical officer of British Guiana. The drug is given in the dose of 20 minims every four hours. After the first three or four doses the urine clears up remarkably. No quinine is given. Iron tonics without quinine are prescribed during convalescence. The action of adrenalin in this instance cannot be explained as due to vasomotor constriction. In his opinion the explanation is probably the balancing of a suprarenal insufficiency, which insufficiency is perhaps the cause of hemoglobinuria in some cases of malarial infection.

TABES DORSALIS.

STARKEY, in the *Journal of the Michigan State Medical Society* for October, 1919, states that his own method of treatment is to first pay especial attention to building up the patient's general metabolism and natural resistance and, if he believes an active syphilitic condition to be present, institute antiluetic treatment, especially by mercurial inunctions. This he believes to be the safest and most satisfactory procedure toward this particular end. For the ataxia, psychotherapy, opotherapy, and exercises, both mental and physical, are of the greatest importance. The personality of the physician and the personality of the patient each play an important rôle in this connection. It is absolutely necessary that the physician have and maintain the entire confidence and coöperation of the patient, and the patient must be of sufficient intelligence to understand and carry out the directions of the

physician. Fear is a very important element in the development and persistence of the ataxic symptoms and is responsible for much of the asynergia exhibited in these cases. Some patients, as soon as they develop the first symptoms of ataxia, become panicky and take to their beds and remain there for long periods. One patient he saw took to his bed, almost immediately after discovering he could not walk in the dark or stand with the eyes closed, and remained there for more than twenty years.

Exercise, both mental and physical, with a view to developing precision and accuracy in thinking and moving are of much usefulness. The system of Fraenkel for many years was used with good results, but has lately been superseded, to considerable extent, by the method devised by Maloney, who has had his patient perform as rapidly as possible certain mental acts, as adding columns of figures, picking out certain letters or numbers or words on a large card, and he has his patients perform their physical exercises blindfolded, upon the theory that the blind tabetics seem to be less ataxic than those depending upon their vision to guide them. The element of fear in destroying equilibrium can be well illustrated by an example Sterling frequently gives, namely, take a four-inch plank twenty feet long and place it on the floor. Any ordinary individual could readily enough walk it, forward or backward, with his eyes opened or closed, but suspend that same plank from a ten-story window and how many of us could negotiate it? The physics and mechanics of the two operations would be identical; the only difference would be the element of fear. Another illustration of this point is that many patients can walk much better with their eyes closed than with them blindfolded. One patient when asked what the reason for this was, answered "Because I know that when my eyes are not blindfolded I can open them whenever I want to and thus save myself from falling."

In regard to physical exercises, after gaining the confidence and coöperation of the patient, blindfold him and have him supine on a table and instruct him to relax all of his muscles. This takes continued practice and must be persevered in until absolute relaxation takes place; then passive movements are instituted commencing with the head and extending to the arms and legs; then the patient is asked to concentrate his mind on the position of the extremities in space, and they are passively placed in various positions and the patient asked to call the position. The feet and toes are passively moved and the patient requested to state the change of position; gradually the patient is gotten upon the floor on his hands and knees (with pads on the knees) and it is astonishing to note that many of these patients are unable to maintain this position with their eyes blindfolded. After becoming accustomed to this position they are asked to throw their weight on one hand or one knee, then alternate the position from one extremity to the other until they can do this rapidly without losing their balance. From this they are brought to the erect position on their knees with arms folded and instructed to balance from one knee to the other. They are taught to walk on the knees with head erect, and finally to stand holding on the wall and change from one foot to the other; then feet are raised alternately from the floor and moved forward and backward and from side to side, then they are required to walk; and all this is done with the eyes blindfolded. These exercises are best conducted in a rhythmical manner in time to a metronome or music; finally the patient is instructed to march to music or to dance to music; phonograph is valuable. During all this process the element of fear must be absolutely excluded, and if it should crop out at any point the patient must go back to the beginning and gradually work up again. This process usually takes from one to three months, depending largely upon the intelligence and coöperation of the patient. Special symptoms, such as those of the bladder, must receive appropriate treatment from time to time. Great care should be used to prevent

overdistention of the bladder, or residual urine. It should be remembered that constant dribbling of urine is not necessarily a sign of vesical incontinence but may be due to constant seeping from an overdistended bladder. Cystitis is frequently the cause of death in this disease.

Starkey expresses the hope that he has succeeded in impressing upon us a broader view of tabes. It is simply a phase of syphilis of the nervous system, not by any means confined to the posterior columns. Treatment should be directed toward the patient as well as the disease.

A PROTEST AGAINST THE RECKLESS EXTRACTION OF TEETH.

ALVAREZ, in the *Journal of the American Medical Association* of October 18, 1919, states that the radical group of dentists tell us that most of our failures to cure are due to the fact that we have not removed all of the diseased tissue from the jaws. They would like to open up the jaw widely and dissect away the alveolar process until the tooth can almost drop out of itself. Naturally these men have a certain amount of right on their side. He, too, has seen a number of cases in which diseased bone or the abscess itself was left by the man who extracted the teeth. There are some people in whom the Roentgen ray shows a widespread change in the bone around the diseased teeth, and in these cases he thinks it is probably advisable to remove enough of the inner or outer plate so that the operator can see what he is doing. He feels sure, however, that in the average case a good extractor can remove the abscess, sometimes entire, hanging to the apex of the tooth.

Many patients will return still complaining of their old troubles, even when the Roentgen ray shows that the removal of diseased tissue has been complete. In some cases the bacteria which may originally have entered through the jaws seem to have obtained so firm a hold on the joints, the heart valves and other tissues that they will not leave simply because their old port of entry has been closed. In other cases, irreparable damage has been done and the joints cannot return to normal even after the disappearance of the infection. We must remember, moreover, that focal infection is probably not the only cause of arthritis, and our clinical study of this condition will not always begin and end with the search for pus.

Alvarez believes the main reason for our disappointments is that in many cases the alveolar abscesses seem to exercise no demonstrable influence on the patient's health. Time and again he has seen powerful and healthy looking men with large alveolar abscesses which they had carried probably for most of their lives. They maintained that they had never had a headache or a twinge of rheumatism, that, in fact, they had never needed a physician. When such a man remains disabled after an injury the dentist often tries to rehabilitate him by removing the abscesses. Naturally, he often fails, simply because something has been taken away which has never had anything to do with the case. It may be, sometimes, that these sacs are as much outside the body as is a calcified tuberculous gland in the lung. When further bacteriologic work has been done we may find that some of them are sterile, the bacteria having died out just as they do in pus-tubes. Particularly in the case of the smaller areas, the necrosis may never have been infectious in origin but may have been produced by the chemicals used during the preparation of the root canals.

Many dentists have become so frightened over the terrible results which they think must follow every root infection that they are refusing to fill any root canals at all. They feel that the risk to life and health is so great that a man should immediately sacrifice every dead tooth in his head. Certainly the thousands of people who for the last thirty or forty years have been chewing contentedly on dead teeth (without signs of root infection) should be grateful that these radical ideas did not prevail

when they were young. The trouble with many of our dentists to-day is that they do not know enough about the wonderful defenses of the body against bacteria. These defenses are particularly efficient in the mouth, where, in spite of the rich flora and the continual trauma, wounds heal with surprising rapidity. Bacteria are constantly getting through the first line of defense only to be stopped at the second, and he sees no reason why the body cannot in many cases protect itself perfectly from the activities of a few invaders which have reached the apex of a tooth.

CHRONIC INTESTINAL INDIGESTION IN INFANTS.

GRIFFITH, in the *New York Medical Journal* of September 27, 1919, states that this is a very common and exceedingly troublesome condition. It may be associated with chronic gastric indigestion, or occur alone. It may be brought about by poor hygienic surroundings, by a congenital constitutional debility, or may follow an acute ileocolitis; but of all factors most frequent is the continued employment of an unsuitable diet. All the causes here are operative which are seen in chronic gastric indigestion. Just what these dietetic causes may be is important but often difficult to determine. Formerly the blame was attached to an excess of protein. Now the disposition is to attribute it to the whey, the carbohydrate, or the fat. In fact, every element of the food has been blamed. The addition of untransformed carbohydrate to the milk mixture is a cause in some cases, while in other instances it appears to be of distinct benefit. Many of the proprietary infant foods would seem to be harmful. It is important to realize, too, that the trouble may not be purely in the intestine itself, although so primarily, so much as due to the metabolic processes in the tissues.

The symptoms vary with the case. In some there is constant diarrhea, with watery, greenish, and sometimes curdy stools. If there is a large amount of mucus present it is probable that a chronic ileocolitis of mild grade has developed. If there is but a small amount, then the disturbance is largely functional. In other cases the stools are diarrheal only at times, but for the most part are pasty and of the soap stool character. Here the fats are clearly not being digested. Vomiting may occur occasionally, or not at all. The appetite is often very good; in other cases poor. The principal symptom is a steadily increasing malnutrition. The impairment of health seems out of proportion to the visible gastrointestinal manifestations. With this preamble it may be readily seen how difficult the dietetic treatment in such cases must be, since we are often so little able to come to a positive conclusion regarding the exact cause of the disturbance. It is necessary to obtain a very detailed history of the previous life of the infant so far as the matter of its diet is concerned. This may show us what fault in the food originally caused the trouble or has maintained it. Then the degree of digestion of the food which is being given must be determined by an examination of the stools. We are now in a better position to institute a proper dietetic treatment.

A word ought to be said regarding prophylaxis. It is very much easier to prevent the occurrence of chronic intestinal indigestion than it is to cure it; and the most important matter here is to avoid weaning if possible. Very many mistakes are made in this connection. An infant in the first few weeks of life does not, perhaps, appear to digest thoroughly, and the physician is too often disposed to advise weaning with what seems to be undue haste. It is perfectly possible that a little longer continuance with breast feeding will establish a more normal secretion of milk and a better digestive power on the part of the baby. Then, too, in the instances where the breast milk is insufficient, it is far better to help out with supplemental feedings than it is to wean entirely, since the breast milk, as far as it goes, supplies elements which the cow's milk does not

contain. In severe cases of disease in babies who have been artificially fed, often the best procedure is the prompt obtaining of a wet nurse. Should this not be possible, however, or for any reason inadvisable, we are obliged to content ourselves with prompt modifications of the diet. If an acute exacerbation of the symptoms be present at the time, we may begin with a temporary partial starvation, using a thin cereal decoction, or arrowroot water. After this the nature of the diet will be determined to some extent by the nature of the stools. The fat is most often at fault; the carbohydrate if the stools are very liquid and of an acid character. In the event of the first we may begin with a skimmed milk mixture, or, better still, buttermilk. The presence of lactic acid in the buttermilk seems to have a decidedly beneficial effect, since Griffith has repeatedly found that food of a similar percentage strength in its ingredients, but made from skimmed milk, is not as well tolerated, and the infant does not grow as well upon it. Casein milk without the addition of sugar is often very serviceable when there is indigestion of the sugar as well as of the fat; the large protein element apparently being well tolerated. It is also to be noted here that there is often a distinct difference in the digestibility of the sugars, and that sometimes saccharose or a dextro-maltose preparation will be borne better than lactose. It is not infrequently observed, too, that unconverted starch is tolerated better than is sugar; and in cases where milk is not borne at all, the diet may sometimes consist very largely of amylaceous substances. It is perhaps for this reason that various malt soup preparations are frequently digested so well. Caution must be observed, however, that the tendency to diarrhea is not increased. Such an occurrence does not mean necessarily that these preparations may be abandoned since suitable medication may relieve the trouble. Sometimes whey is extremely useful as a temporary food. Its caloric value, however, is not great enough for any long continued employment of it.

With regard to all these substitutes for the ordinary diet, it should be borne in mind that they are but substitutes, and that in most cases it is wise to return as soon as convenient to a regular milk mixture suitable for the condition of the child. There should, however, be no undue hurry about this, and it is perfectly possible to feed an infant satisfactorily on a buttermilk mixture or malt soup for months at a time. Indeed, if the child is found to be thriving on it, there is really no reason for a change at all until the age of a year is reached, when the ordinary diet for that age may be instituted. All this must be determined in the individual case.

The matter of the dilution of the food and the frequency of administration is also important. Some children do better when the food is concentrated; others when it is more diluted, although the total number of calories may be the same. Only a trial can show which is the best in the particular case. Then, too, the mutual influence which the various food elements exercise upon each other is of importance. The protein and the fat, for instance, may be made more digestible if a high carbohydrate content is present; and it is possible, as Finkelstein asserts, that the fat is better tolerated if the whey, with its contained salts and sugar, is reduced.

INTRAMUSCULAR INJECTIONS OF QUININE IN THE TREATMENT OF MALARIA, AND SOME CONJECTURES CONCERNING QUININE THERAPY IN GENERAL.

WILTSHIRE, in the *Journal of the Royal Army Medical Corps* for September, 1919, states that in the treatment of the malaria of Macedonia intramuscular injections of quinine have been found harmless, and much superior to oral administration in the following respects:

(*a*) They improve the prognosis of life.

(*b*) They are more certain in action during the acute stage of the disease.

(*c*) They add greatly to the chance of effecting a true cure of the disease.

Consideration of the different methods of administration of quinine in respect of the therapeutic results attained, the amount of quinine excreted in the urine, the affinity of quinine for the proteids of blood and tissues, and the toxic effects produced, suggest that:

(*a*) The real antiparasitic agent is to be found in an unstable combination of quinine with a proteid of the blood plasma.

(*b*) That the quinine which circulates in the blood in simple solution and is excreted in the urine unchanged, may be regarded as a waste product, and is innocent of antiparasitic effect.

(*c*) That some of the toxic effects produced by quinine on the body are due to the unchanged quinine which circulates in the blood in a state of simple solution.

Whether these conjectures are right or wrong can be settled by combined chemical and clinical investigation. Here it is only claimed that the subject is of sufficient importance to deserve investigation by some one with the chemical knowledge which Wiltshire lacks, and the facilities provided by a laboratory equipped for pharmacological research.

INTRAVENOUS INJECTIONS OF TARTAR EMETIC IN BILHARZIASIS.

TAYLOR, in the *Journal of the Royal Army Medical Corps* for August, 1919, states that in all his cases the solutions used in the injections were made by dissolving the tartar emetic in freshly distilled sterile water in the strength of one grain in six cubic centimeters and then sterilized by autoclaving for one hour. At first the injections were administered every two days with a maximum dose of two grains, whilst on the later cases of the series he worked up to doses of three grains administered twice a week.

No serious drawback, no marked toxic manifestations, and no severe reactions followed the injections. With one exception all the patients were troubled with irritation of the pharynx and a spasmodic outburst of coughing either during or after the injections, usually just at the end of their administration. In four cases stiffness and cramp of the muscles of the neck and shoulder girdle were complained of. Gastrointestinal symptoms were fairly frequent, comprising nausea in three cases, vomiting (usually once only) in four cases, and slight diarrhea in three cases. Headache was noted in two cases. There was induration at the seat of injection in two cases. Pyrexia (to 103° F.), slight giddiness, pains in the body, general pruritus and loss of weight were noticed in one case each. These untoward effects of the injections may be tabulated thus:

Cough and pharyngeal irritation	in 9 cases
Stiffness of neck and shoulder muscles	in 4 cases
Nausea	in 3 cases
Vomiting (slight)	in 4 cases
Diarrhea (slight)	in 3 cases
Headache	in 2 cases
Induration	in 2 cases
Pyrexia (to 103° F.)	in 1 case
Giddiness (slight)	in 1 case
Pains in the body	in 1 case
General pruritus	in 1 case
Loss of weight	in 1 case
Relapse of hematuria	in 1 case

The immediate beneficial results of the injections were very striking and comprised a rapid disappearance of the blood and ova from the urine, disappearance or mitigation of the hypogastric and perineal pains and pain on micturition, improvement in the anemia, gain of weight, and a quite striking improvement in the general appearance and feeling of well-being in the patients.

The remote results of these cases he is unable to discuss owing to the short time which has elapsed since the injections were given and to the fact that all the patients have left the hospital. As far as is known all the cases have remained free from symptoms except Case 9, who developed a small hematuria within a week of the completion of his course of injections, although no ova could be discovered on microscopic examination of his urine. Case 3 was so pleased with the results of his treatment that he wrote from the country under date of December 22, 1918: "The hemorrhage has completely stopped, and bar a little pain

in the affected region I am practically fit" (although he states elsewhere his duties are not of a very light character). "There are one or two fellows here who are discharged with bilharzia and have had no treatment whatever. They are naturally anxious to undergo this particular treatment. I should be greatly obliged if you could inform me as to the course they should adopt to obtain it."

That tartar emetic when injected intravenously exerts a striking beneficial effect on vesical bilharziasis is amply demonstrated by the cases here recorded, but the manner in which this effect is produced is not so evident. That the drug kills or inhibits the activity of the parasite appears to be the most reasonable suggestion. At what stage in the life history of the parasite this occurs, whether ovum, miracidium, or adult worm, or all three, has not yet been demonstrated. Christopherson claims that the tartar emetic exerts a direct helminthicidal action on the adult worm. Direct experimental proof on this point is still lacking, though Archibald and Innes's case, the only one so far submitted to post-mortem examination, provides some support for this view.

The high toxicity of tartar emetic has always been a matter of serious concern to all who have employed it in the form of intravenous injections, especially in the intensive manner which now prevails for the treatment of bilharziasis, trypanosomiasis, and leishmaniasis. That such injections are not free from risk is shown by a recent paper by Knowles and by Archibald and Innes. The former recorded five deaths out of twenty cases of kala-azar treated by tartar emetic, whilst the latter record a fatal case of bilharzia so treated. The case of Archibald and Innes was a strong Egyptian soldier suffering from hematuria whose urine showed a heavy infection with terminal-spined ova of bilharzia. The solution employed for intravenous injection contained one grain of the drug dissolved in two cubic centimeters of sterile water, being mixed immediately before use with an equal amount of sterile normal saline solution. The initial dose was ½ grain, gradually increasing to a maximum of two grains until a total of thirty-three grains was given, the injections being given every second day. At the end of the treatment the urine contained blood, but no ova. The patient then developed influenza and died on the fourth day of the illness from bronchopneumonia. At the autopsy no adult worms could be found, though the congested mucous membrane of the bladder contained large numbers of bilharzial ova. The liver and kidney cells and the tunica intima of the inferior vena cava showed fatty degeneration and fatty infiltration, changes which were attributed to the action of tartar emetic and were not sequels of bilharzia, influenza, or a previous malarial infection.

This opinion of Archibald and Innes appears to be correct, as somewhat similar lesions are found in certain toxic conditions, especially in the liver in the closely allied conditions of arsenic and phosphorus poisoning, and as was found by Gregorson and Taylor in trinitrotoluol poisoning.

The toxicity attributed to the ova and miracidia of bilharzia by two Japanese observers, Kiyono and Murakami, does not appear to produce fatty changes in the liver but leads to a cirrhotic condition of that organ.

Although in Archibald and Innes's case the cause of death appears to have been influenzal bronchopneumonia the degenerative changes in the liver and kidneys may have been recoverable, or may have been due to undue susceptibility of the patient to antimony. That very much larger doses of tartar emetic can be given intravenously with perfect safety is evident from a case under the care of Daniels, and treated by Newham, at the Seamen's Branch Hospital attached to the London School of Tropical Medicine. This was a patient infected with Trypanosoma rhodesiense, who received 236 biweekly intravenous injections of tartar emetic in the course of two and a half years. The maximum dose was 2½ grains, and the quantity administered

amounted to the enormous total of 550 grains. The patience of the physician and the fortitude of the patient were finally rewarded by the complete recovery of the patient from the most virulent of all the forms of trypanosomiasis, and the patient happily remains free from symptoms both of the disease and of antimony poisoning until the present day.

Since the risks of antimony poisoning as the result of intravenous injections, though apparently not very great, cannot be ignored, other forms of antimony should be sought with equal therapeutic effects and a diminished toxicity. Antimony and arsenic are so closely allied in their chemical characters that this condition would probably be brought about by the production of organic compounds of antimony. Since antimony and arsenic are very closely allied in their chemical characters and the toxicity of arsenic has been greatly reduced without diminishing its therapeutic action by introducing arsenic in organic combinations in such drugs as salvarsan and its substitutes, it would appear highly probable that similar organic compounds of antimony would be similarly influenced. In view of the prevalence of trypanosomiasis, leishmaniasis and bilharziasis in various parts of the world and the undoubted beneficial effects of antimony compounds on these diseases, the production and thorough investigation of such organic compounds of antimony is one of the pressing problems of the day in tropical medicine.

Meanwhile Sir Leonard Rogers has drawn attention to the occasional danger from the toxicity of tartar emetic intravenously and has done the pioneer work in searching for equally efficient but less toxic forms of antimony. In 1916, he recommended sodium antimony tartrate, Plummer's salt. More recently he has employed colloid antimony sulphide intravenously in kala-azar. He found it effective in smaller doses, being retained in the blood longer than the soluble tartrates of antimony, and concludes that colloid antimony sulphide appears to be a distinct advance on soluble antimony tartrates in the treatment of kala-azar and thinks it would be well worth trying in sleeping sickness. In view of the efficacy of the soluble tartrates in bilharziasis, as well as of the occasional danger arising from their toxicity, it is evident that colloid antimony sulphide given intravenously would be well worth trying in bilharziasis.

THE PROPER MANNER OF SUBMITTING MATERIAL TO A TOXICOLOGIST IN MEDICOLEGAL CASES.

In the *Wisconsin Medical Journal* for September, 1919, LOEVENHART states it is extremely important that prosecuting officers, physicians, and others who wish to submit material for the consideration of the pharmacologist and toxicologist should take every precaution to see that the material is guarded from any possible source of contamination which might tend to cast doubt upon the trustworthiness of his findings.

The legal requirements are as follows: the material obtained at the autopsy table or otherwise should be so handled as to preclude the possibilities that poison might have been added between the time that it left the hands of the physician who did the autopsy and the time that it reached the toxicologist. There should be no possibility of the material having been tampered with by any one during this interval. All vessels should be washed or finally rinsed by the physician doing the autopsy so that he may take oath on the stand that they were clean. After removal of the material, the containers should be sealed with sealing wax, using a characteristic seal. In the absence of any other seal, the thumb print may be used, but a better method is to buy an ordinary letter seal upon which some extra letters or some plain scratches may be made with any sharp instrument. This will give a seal which is characteristic and which can be produced in court. In some cases the container may be tied with cord in such a manner that the ends of the cord pass through the characteristic seal so that it

would be impossible to open the vessel without breaking the seal. Under these circumstances the package may be sent by registered mail or by express enclosed in a second wrapping sealed with the express company's seal. However, in a serious case, as in the suspected poisoning of a human being, the material should be brought to the toxicologist by a special messenger who can take oath on the stand that the material could not have been tampered with while in his possession. It is decidedly preferable that each person handling the material be available at the trial, so that he may be placed on the stand and take oath as to what happened to the material while in his possession.

How useless it is for a toxicologist to work behind locked doors in such cases in order to prevent the malicious sending of material by any one interested in obtaining a conviction, unless the material is handled properly before it reaches him. It is as much the duty of the physician and toxicologist to protect the innocent against false accusation of poisoning as it is to obtain the conviction of a guilty individual.

It would be impossible to enumerate the number of instances in which material has been submitted in an improper manner. A few instances might be cited. A knife was submitted with red stains upon it with the request that he determine whether the stains were from human blood. The knife was wrapped in a piece of paper and tied with a string. Any one interested could have placed blood on this knife in transit. A piece of iron piping which was similarly wrapped was submitted with red spots to be tested for human blood. Gastric contents have been received any number of times in an ordinary bottle wrapped in the most ordinary fashion. It would be simply a waste of time on the part of a toxicologist to examine such material. It is only fair to state that where material has been submitted by prosecuting attorneys in many instances, the manner of submitting the material has been equally bad. Since such cases occur at rare intervals in medical practice, one is likely in the excitement of the moment to throw away all opportunity of obtaining a conviction unless he has the matter constantly in mind.

THE WALCHER POSTURE VERSUS CÆSARIAN SECTION.

BIGGAR, in the *Journal of the American Medical Association* of September 20, 1919, states it is surprising how many Cæsarian sections are being performed by the younger class of obstetric surgeons. One obstetric surgeon reports that, though he has not been in practice more than ten years, he has already passed his one hundred and fiftieth Cæsarian section. It may be questioned whether the conditions warrant the operation. Has not nature perfected the proper way for normal birth?

Cæsarian section is justifiable only when the following conditions are present: contracted, deformed or diseased pelvis; placenta previa; eclampsia; fibroid tumor; kyphosis; osteosarcoma of the pelvis; hypertrophic elongated cervix; uterine fibroma; malignant disease of the cervix uteri; face presentation with chin directly posterior; funnel pelvis; inoperable carcinoma of the uterus; presentation of the head, cord and foot; atresia of the vagina; deformities of fetus of abnormal development, including the hydrocephalic fetus; ruptured uterus; hydramnios; suppurating ovarian cyst; double uterus; adherent placenta and ruptured uterus; Bright's disease; difficult labor after ventral fixation of the uterus; scar of old operations for other conditions; vaginal occlusion; dyspnea; cyanosis; anasarca and albuminuria; dermoid cyst of the pelvis; malignant ovarian tumor; labor with impaction; rigid os; pendulous abdomen; malignant disease of the rectum; and anteversion of the gravid uterus.

Biggar urges the physician to try the Walcher posture before using the knife. He has found this posture efficient in quite a number of patients, even though Cæsarian section was advised by reputable surgeons,

and the patients were willing to submit to the operation.

The patient is placed in the decubitus position on a table with one end so elevated that the nates project well over the edge, the legs hanging perpendicularly, the feet not touching the floor. When the head presents in the soft parts the end of the table is lowered so that the top is level. The patient is then put in the extreme lithotomy position and delivered with or without instruments. This position increases the diameter of the superior strait of the pelvis one-quarter inch or more.

SOME NEW OBSERVATIONS ON THE TREATMENT OF SEBORRHEIC ERUPTIONS.

BARBER and SEMON, in the *Journal of the Royal Army Medical Corps* for September, 1919, state that when the possibility of the existence of acidosis in seborrheic patients first occurred to them they immediately began to test the therapeutic effects of giving an alkaline mixture thrice daily an hour or half an hour before meals. Their original recipe consisted of sodium citrate, 30 grains; sodium bicarbonate, potassium bicarbonate, ää 15 grains; infusion of gentian compound, 1 ounce. The beneficial result of this treatment was apparent, but it was observed that many patients did not pass alkaline urine until after they had taken the medicine for many days or even weeks, and in some the urine remained persistently acid. They then decided to employ a mixture modeled on a formula suggested by Dr. Langdon Browne for the control of acidosis in diabetes, viz., sodium bicarbonate, 1 drachm; potassium citrate, 30 grains; calcium lactate, 5 grains; magnesium carbonate, 5 grains; chloroform water, 1 ounce. This preparation has now been given in hundreds of cases, and careful observations have been made on the reaction of the urine from day to day. As a result of its use these clinicians assert two fundamental facts have been established:

1. That the majority of patients with seborrheic manifestations show a markedly increased alkaline tolerance, many of them to an astonishing degree.

2. That in nearly all cases, once the urine has been rendered alkaline all active inflammatory processes cease, and the eruption rapidly clears.

As examples of unusual alkaline tolerance the following cases may be quoted:

Case 1.—This patient took four ounces of above mixture per diem for three days; urine still strongly acid. Then six ounces per diem for twelve days; urine still acid. Then nine ounces per diem for two days; urine still acid. After nine ounces per diem for two more days urine became alkaline. That is to say, this patient consumed during a period of nineteen days fifteen ounces of sodium bicarbonate and seven and a half ounces of potassium citrate without passing an alkaline urine, and it was not until he was taking nine drachms of sodium bicarbonate and four and a half drachms of potassium citrate per diem that an alkaline urine was obtained.

Case 2.—This patient took three ounces of the mixture daily for twenty-two days; urine still acid at the end of this time. He then took four and a half ounces per diem for three days and nine ounces per diem for two days; urine still acid. After taking nine ounces per diem for five days urine became alkaline.

Case 3.—This patient consumed six ounces of the mixture per diem for twenty-one days, and his urine was still strongly acid at the end of this time.

Many other cases showing a similar alkaline tolerance could be given. Such extreme instances are, however, exceptional, but the very great majority of patients with active seborrheic lesions show a tolerance far greater than that observed in normal persons, in whom one single dose of the mixture is sufficient to render the urine alkaline.

After studying the effect of giving alkalies in some 300 cases with seborrheic manifestations they have satisfied themselves that their action may be described as

specific. As remarked above the tolerance varies in different persons, so that the quantity of alkali required to produce the desired effect must be determined by repeated examinations of the urine.

In the great majority of cases the activity of the inflammatory processes ceases as soon as the urine is rendered virtually alkaline.

So constant is this phenomenon that it is almost always possible to predict with confidence that, should a patient under alkaline treatment present new or active lesions (*e.g.*, eczema or boils), his urine will be found to be still acid; an increased quantity of alkali must therefore be given until the reaction of the urine changes.

As might be expected, the lower the alkaline tolerance the more rapid is the reaction to treatment, and the less the tendency to relapse.

The most convincing clinical proof of the influence of alkalies in these cases was afforded by patients in whom, after an initial cure, active seborrheic manifestations recurred when the alkaline mixture was discontinued, only to disappear again, often without any local application when the alkaline treatment was resumed.

Barber and Semon do not contend that administration of alkalies abolishes the necessity for local applications, but that this method of treatment hastens in remarkable fashion the clearing of the various eruptions dependent on the seborrheic state, and provided that the patient be then given an adequate quantity of alkaline salts per diem relapses will not occur.

The best local applications are oily alkaline suspensions of calamine, *e.g.*:

℞ Calamine præp., gr. xxx;
Aqua calcis., ʒij;
Ol. arachis. vel ol. olivæ, q. s. ää fʒj.

Most seborrheic lesions are amenable to this application, which should be renewed not less than twice daily, on lint.

When oil is difficult to obtain in sufficient quantity, they found bicarbonate of soda in two-per-cent solution in water very useful. It must be applied thrice daily at least, as a "soak" on lint under jaconet, and should be changed once during the night if the lesions are very acute.

At a later stage when erythema and congestion with irritability of the skin surface persist, the part should be covered with lint or linen smeared with Lassar's paste. All hairy parts, with the exception of the eyebrows and lashes, should be close cropped or shaved.

ATROPINE TREATMENT OF PYLOROSPASM AND PYLORIC STENOSIS.

Haas, in the *New York State Journal of Medicine* for October, 1919, summarizes his article as follows:

1. Hypertrophic pyloric stenosis is probably only an advanced degree of pylorospasm.

2. Both are manifestations in the syndrome of hypertonia (hypertonic infant).

3. The etiology is probably a disturbance in the physiologic action of the vegetative nervous system.

4. The vegetative nervous system is made up of two parts, the autonomic and the sympathetic; normally in balance. In this condition, however, there is an overaction of the automatic, or vagotonia.

5. This does not gainsay the occasional existence of true organic stenosis of the pylorus.

6. Despite the brilliant results of many surgeons with the Rammstedt operation, an operation should be rarely required, and performed only after atropine has been given a trial.

7. Atropine properly used has been regularly effective in producing a cure.

8. At the present time the weight of authority would seem to indicate that hypertrophic pyloric stenosis and pylorospasm are two definite clinical entities.

In favor of this view is the existence of a cartilaginous hard mass at the pylorus in cases of stenosis, and the persistence of this mass long after a cure has been obtained by operation or otherwise.

(*a*) Against this view is Haas's personal experience of the last four years; all cases

of pylorospasm, including four for whom operation had been advised, responded to treatment by atropine. A case of complete stenosis responded equally well.

(*b*) Ransohoff and Wooley held an autopsy on an infant at seven and a half months which had had a Rammstedt operation at the age of two weeks, when a cartilaginous hard mass existed. At the autopsy this was absent and the pylorus patulous.

(*c*) Rachford states that if the pyloric sphincter is so cut as to leave the orifice patulous and prevent muscular spasm of these fibers the pyloric tumor disappears.

(*d*) Strauss, in a discusion of 65 tumors at operation, showed that the tumor was absolutely proportionate in size to the age of the infant, "which demonstrates that the tumor must be a progressive developmental affair."

(*e*) The absence of fault in the arrangement of the normal histologic elements of these tumors speaks loudly in favor of a functional creation.

(*f*) Rogers states that in fatigue the inhibitory impulses of the sympathetic system fail, and the vagus, then overacting, causes hypersecretion, hyperacidity and hypermotility of pylorospasm.

9. Among the arguments used against medical treatment is the sudden death, which not infrequently occurs. These are usually thymus deaths, and occur in cases operated upon, as well as those medically treated.

10. Atropine is the logical treatment in these cases, owing to its paralyzing effects upon the vagus nerve endings.

11. Certain facts must be borne in mind regarding atropine:

(*a*) The inconstancy in value; resembling digitalis in this respect.

(*b*) Its rapid deterioration.

(*c*) It must be used in sufficient dosage to be effective.

12. A common dose of atropine for an infant of this type from a few weeks to a few months of age totals gr. 1/50 to 1/25 in twenty-four hours, with an extreme of gr. 1/16 divided among the day's feedings, a 1:1000 solution being used, beginning with one drop and increasing rapidly until effective.

13. The most frequent toxic symptoms are flushing, mydriasis, and dryness, which disappear promptly when the drug is withheld. There is no danger even when such symptoms present themselves.

[Nevertheless these are heroic doses for an infant.—ED.]

SYPHILITIC AND ARSENICAL JAUNDICE.

SCOTT and PEARSON, in the *American Journal of Syphilis* for October, 1919, state their conclusions as follows:

1. Jaundice occurring during early syphilis is of two types: (*a*) Syphilitic, in which the jaundice may appear before treatment or may be provoked by the Herxheimer reaction, appearing within the first three weeks after the first injection of the arsenical preparation. Pathologically this condition is a diffuse degeneration of the liver cells produced by the toxic action of the Treponema pallidum. (*b*) Combined syphilitic and arsenical, appearing after the fourth injection of the drug. The pathology of this condition is the same as that of the preceding group. The causative factor is primarily a syphilitic degeneration of the cells on which is superimposed the toxic action of the arsenic.

2. Jaundice due to the combined action of syphilis and arsenic is not an obstructive jaundice, but is characterized by a diffuse degeneration of the liver cells.

3. Every case of syphilis, whatever the stage, should be carefully examined for any previous or present condition that would produce a damaged liver, and such cases treated with the greatest care in order to prevent the occurrence of jaundice.

4. Every case of syphilis under treatment should be carefully observed for any reaction following each injection of the

arsenical compound. Scott and Pearson consider the taste or the smell of the drug during, or after, the injection an important sign of early intolerence. Should any reaction occur or any sign of intolerance develop, the patient should immediately be placed on a course of intramine.

5. Intramine is apparently a specific for early or late combined syphilitic and arsenical jaundice. It is also apparently a specific to prevent the arsenical compounds from exerting a toxic action, particularly on the liver.

TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM.

NICHOLSON, in the *American Journal of Syphilis* for October, 1919, says that the selection of the type of intraspinal therapy to meet the indications in the indivdual case is not difficult. In his hands the interstitial type bears mercurialized serum better than the parenchymatous type. Under the former are included such conditions as cerebrospinal syphilis, which included gumma formation, meningitis luetica, and meningoarteritis. The parenchymatous type does better with the salvarsanized serum, although Haller puts general paresis in the group that stand the mercurialized serum better than do cases of tabes dorsalis.

The treatment of Nicholson's cases of paresis has been such a failure that he is almost tempted to give up trying any therapy; however, if these patients can improve for a short time, the result, even if it only renders them temporarily capable of adjusting their business affairs, doubtless justifies the effort.

Owing to the established fact that the reaction following the intraspinal injection of mercurialized serum is more severe than when salvarsanized serum is used, but that the laboratory findings in the spinal fluid are more favorably influenced when the mercurialized serum is used, his patients are usually started on the salvarsanized serum, which is alternated within the next ten days with mercurialized serum in smaller doses than was formerly used—*i.e.*, instead of using 1/50 grain of bichloride of mercury as an initial dose, 1/100 grain is used and gradually increased to 1/50 grain, which is the maximum dose used, instead of 1/25 grain, which was formerly used.

The remaining features of the technique aside from the preparation of human serum in stock quantities is based on previously published experimental work; for example, Swift has shown that when salvarsan is added to serum *in vitro*, its spirocheticidal action is increased by heating.

As has already been noted, the plain serum is heated to 56° C. when it is first prepared and reheated and incubated when the salvarsan is added just previous to its administration.

Swift has also indicated that in his opinion salvarsan-treated patients produce a better serum than normal patients. In his method of preparation he never uses the serum of patients who have had salvarsan ten days previous to the bleeding for a stock serum for obvious reasons; furthermore, even the salvarsan-treated patients should, in his opinion, have a negative Wassermann.

There should be little necessity for a plea for intraspinal medication in syphilis of the central nervous system. Until a more effective therapy is evolved by further investigation and increased knowledge of the Treponema pallidum, we would be guilty of neglect if we failed to give our patients the benefit of the intraspinal methods of treatment at our disposal. It is recognized that in a great number of cases the use of mercury, iodides and the arsenical preparations exert a very beneficial influence on the course of syphilis of the central nervous system, especially in the incipient and early types of the disease. The tendency of syphilis of the central nervous system to relapse in spite of heroic systemic treatment is, of course,

at the present time, axiomatic. Laboratory findings in the spinal fluid are often unchanged regardless of energetic systemic treatment until intraspinal therapy is begun.

WHAT DID JOHN HUNTER DO FOR MEDICINE?

KEITH, in the *British Medical Journal* of October 18, 1919, says: "All living matter, he found, was endowed with the power of mending a breach in its substance and of throwing off disease. He had the audacity to believe that he could, by the application of special methods, wring the secrets of life from living bodies, and that by studying closely the manner in which Nature effected her cures in the human body, he could steal her secrets and apply her methods."

[This has therapeutic bearing because some physicians, who work only in the dead-house, are therapeutic unbelievers.—ED.]

TREATMENT OF LATE SYPHILIS.

HAZEN, in the *American Journal of Syphilis* for October, 1919, says it is generally considered unwise to give any one drug for a long space of time, inasmuch as it will lose its killing power on the parasite: the old continuous method of administering mercury for year in and year out is rightly considered most unwise, and to adminster arsphenamine at weekly intervals for a long space of time is probably just as bad. The general tendency is to give short and intensive alternating courses of the two drugs, with certain periods of rest if the treatment must be prolonged. Before considering a case Wassermann-fast the spinal fluid must be examined, and it is not unusual to find a focus in the nervous system in such cases.

Of course it is realized that it is absolutely impossible to lay down any hard and fast rule that will govern every particular case, for the best syphilologist is the man who can adapt himself to circumstances, but at the same time there must be some sort of a standard course from which suitable migrations can be made.

In addition to the actual treatment the kidneys must be watched, the spinal fluid should be examined if there be the least suspicion of cerebrospinal involvement, and the reflexes should be gone over at least once in two months. Also it would be a wise scheme to have an occasional eye-ground examination, inasmuch as some exceptional cases will show trouble here even when the spinal fluid is but little altered. The aorta should be fluoroscoped at least once in two years.

FOOD FACTS AND FANCIES.

GREELEY (*Wisconsin Medical Journal*, August, 1919) in an entirely rational article on this subject lays down certain fundamental laws for the better health of our people. These are as follows: It is up to us to help the world get back to the nutritional attitude toward food. We eat to live—not live to eat. Every physician should know the elements of a balanced diet and should be able to tell each family under his care what and how much food to select. He should know what proportion of cereals should be taken, of fats and proteins. He should advise about the bulk of a diet, about salts and vitamines in diet; more important in metropolitan than in rural communities, but important in all.

PROGRESS OF ORTHOPEDIC SURGERY.

Under this title BUCHOLZ, SOUTTER, OSGOOD, LOW and DANFORTH (*Boston Medical and Surgical Journal*, Aug. 21, 1919) make the following observations and abstracts from literature:

It is not yet a sufficiently appreciated fact that many cases of old fracture of the spine, even without injury to the cord, suffer from prolonged and permanent disability due to the interference with the function of the spine. To relieve this disabling condition, Brackett has performed an Albee

operation in a number of these cases, and the present communication, which he has written in conjunction with Mixter and Wilson, has as its object to determine by a comparison of operative and non-operative cases whether this operation is advisable. None of the cases considered have had symptoms of nerve injury, or at least not more than passingly, and in all cases has the diagnosis been verified by an *x*-ray picture. Of the nine cases operated, five have had previous supportive treatment, leaving all more or less disabled. The other four were operated within eight weeks from the injury. All operated cases have since returned to the same, or a similar, occupation; one of the early cases, operated on the seventeenth day, removed his support after eight weeks and returned to work three months after the injury, calling himself well. Another, operated three months after the fracture, which was followed by increasing deformity, resumed full work as a lineman six months after the operation. These cases are compared with 18 cases of fracture of the spine without cord symptoms, which have not been operated. All of these have had, or still have, supportive treatment, but only four have returned to occupations similar to the ones they had before the accident. The others are more or less disabled and in a considerable percentage unable to do any work.

The operative indications are given somewhat tentatively for the fresh cases: (1) abnormal mobility; (2) increasing deformity; (3) extensive fractures. The cases should not be operated within the first two or three weeks because of the danger from hemorrhage. Also cases with symptoms of a crushed cord or an extensive nerve lesion are not suitable for operation. Finally, the general condition of the patient, pulmonary disease, etc., are to be taken into account. In old cases the operation is indicated if the patient is disabled by pain, either local or referred, or weakness of the back, or if the deformity increases.

The technique follows the rules laid down for Albee's operation, a deep, strong graft being used, which is to reach two sound vertebræ above and below the seat of the fracture. When the fifth lumbar vertebra is broken the lower end of the graft is split and fastened astraddle to the spinous processes of the upper sacral vertebræ.

The authors conclude by saying that there is strong evidence in favor of an early operation.

For the repair of the ruptured crucial ligaments of the knee-joint, Groves has devised an ingenious plastic operation. For the anterior ligament he uses the iliotibial band; for the posterior ligament, the tendon of the semitendinosus, these structures being pulled through holes drilled through the condyles as nearly as possible according to the normal course of the crucial ligament. He opens the joint with a wide horseshoe incision, going down to the hamstrings, and does a temporary resection of the tibial tubercle. In closing, the tibial tubercle is fixed by a nail of metal or ivory. The leg is placed on a back splint for about a fortnight, to be followed by gentle massage and passive movements.

Generally speaking, Smith says, the immediate treatment of injuries to crucial ligaments should be conservative rather than operative. Recent injuries to the joint that show abnormal mobility should be roentgenographed as a routine. This will eliminate avulsion of the tibial spine. Where there is rupture of both crucials, due to lateral or posterior dislocation of the knee, the limb should be immobilized with the knee flexed to 20 degrees for at least three months, but faradism to the quadriceps and general massage with movements of the patella should be practiced daily. Good results have been reported from treatment by prolonged fixation of the joint. When the lesion is accompanied by a paralysis of one or both of the popliteal nerves due to stretching, postural and electrical treatment for the nerve injury must also be undertaken. Where there is a recent avulsion of the tibial spine, Smith advises to try the effect of immobilization of the

knee in the fully extended position for twelve weeks, combined with massage and faradism, rather than to treat the cases by primary operation and fixation of the detached ligament and its insertion. In cases of old standing, however, operative measures are indicated. The after-treatment of anterior crucial injuries can generally be undertaken by means of appliances worn for an indefinite period.

In the surgical treatment of crucial injuries, the following operations have been done at varying times, apart from those of immediate suture of the ligaments: (1) Plication; (2) reefing; (3) wire loops; (4) silk ligaments substitution; (5) fascial substitution. Smith's experience with these operations leads him to indorse only fascial substitution.

The reviewers object strongly to the advice to immobilize the knee-joint in the fully extended position for twelve weeks, as such a measure is apt to lead to stiffness of the knee and will probably disable the patient more than insufficiently healed crucial ligaments ever would. They are inclined in early cases to combine fixation in semiflexion with massage and gentle assisted active-passive motions; and to operate if the knee heals with definite symptoms of tearing, chiefly instability.

The first and most essential procedure in the treatment of fractures of the os calcis in the opinion of Magnuson is tenotomy of the Achilles tendon. This will relieve the pulling up of the short posterior fragment and prepare for the second step, which consists in the restoration of the longitudinal arch by forcible manipulation over a block. A plaster casing is applied in fully corrected position and retained for several weeks, followed later by adhesive plaster strapping with felt pads.

Brickner records a number of interesting histories with operative findings of cases of spina bifida occulta which he divides into four groups: (1) cases with external signs with symptoms such as trophic disturbances, anesthesia, etc.; (2) with external signs without symptoms; (3) without external signs with symptoms; (4) without external signs without symptoms. Of special interest has been the observation of growth of callus as a purely trophic phenomenon independent of pressure and the prostration and marked rise of temperature which preceded and accompanied the outbreak of an ulceration. Brickner comes to the conclusion that the results of operation for spina bifida occulta are not brilliant, probably for the reason that the degeneration and neoplastic processes are scarcely remediable. Those cases in which there is a hernia of the spinal root probably offer the best chance for a good result; for the reduction of this hernia into the bony canal, by relieving the contained nerve roots of traction and pressure, may greatly improve the existing symptoms or prevent the development of some others. Even when there is no meningocele, much may be found possible at the operation; for example, separation of adherent nerve roots from the membrana neurium, division of a connecting band, removal of an endostosis, or perhaps even the removal of the cauda equina.

Brickner considers the following as legitimate indications for operation: (1) In infants and children with congenital lipoma or hypertrichosis, even though without symptoms, as a preventive measure; (2) in adults with sufficient serious and especially progressive symptoms, whether or not it is marked by external signs. Such symptoms would be progressive gangrene of the lower extremities or incontinence of the sphincters. Brickner has found in the literature 12 operated cases, to which he adds 5—all of the 17 without mortality and some with decided benefit.

Merrill has made careful clinical and radiologic studies of the distortion of the pelvis from postural defects. Where weight, *e.g.*, is habitually borne on the right leg, the abductor muscles are relaxed, the pelvis tilts to the left, the left knee is flexed, and a left lumbar scoliosis with increased lordosis results. This apparently leads to

an increased action of the left long posterior muscles, and a stress is so applied to the pelvis that the left ilium is flattened and torsed on its long axis: that is, the ilium is rotated to the left. The constant stress on the left ilium produces a distinct and sometimes very marked bony hypertrophy along the insertion of those muscles. The two ossa innominata are rotated in opposite directions, and from this rotation results a relative elevation of the left anterior superior spine. The usual way of measuring the length of the legs from the anterior superior spine is insufficient in such cases. To be exact, five measurements should be taken, from (1) the tuberculum pubicum; (2) the anterior superior spine; (3) the crest of the ilium; (4) the tip of the trochanter; and (5) the posterior superior spine.

As a reliable non-slipping support of the sacroiliac joint, Owen has devised a low corset with double spica extension. It is laced in front of the abdomen and the thighs and a reënforcing belt is applied between the crest and the trochanters.

DELAYED SUTURE OF SIMPLE FLESH WOUNDS.

Bleier (*American Journal of Surgery*, August, 1919) contributes an excellent article on this subject. He states that in the service there were two methods of preparing wounds for secondary suture and closure. The first was by the Carrel method. The results of this were startling and corresponded in detail with the results published by Carrel and Dehelly. The wounds assumed within forty-eight to seventy-two hours a clear, healthy appearance, a bright-red color with little or no secretion, and bacterial counts of less than one to five fields. The granulations were firm and flat, never puffy. However, this result could be obtained only if every detail of the technique had been carefully attended to; any slip, such as improper placing of tubes, failure to give the proper amount of fluid, failure to give fluid regularly, impaired the sterilization of the wound. And as the service grew in size, errors in technique became more and more numerous, so that after six weeks it was impossible to rely upon the treatment for large numbers of cases, not because of any defects in the principle of the method, but because of the futility of attempting to carry it out on a large scale, with an insufficient medical force. Such insufficiency existed at many hospitals, for example, where one surgeon took care of 250 to 300 cases with the assistance of four or five day nurses, rarely a night nurse, and some medical corps men.

A typical instance, not at all uncommon, demonstrating the result of faulty technique was as follows: A wound apparently carefully treated for several days according to the Carrel method, and presenting a clean, healthy surface, bacteriologically negative, would be scheduled for suture the next day. At the operating table, instead of finding the same healthy surface, one would see a surface covered by purulent secretion and puffy granulations, due to failure to give injections the night before. Such errors became increasingly more frequent as the exigencies of the service became greater. It became more and more evident that Carrel treatment, to be effectual at all, must be conducted with extreme care and minute attention to detail; and this care could not be given with an insufficient or a constantly shifting personnel, for in addition to the handicap of small numbers, doctors and nurses were frequently ordered from post to post or from one ward to another, according to the needs of the military service. Bleier had the unusual good fortune to remain in charge of one surgical building for a period of over six months.

The other method for preparation of wounds for secondary closure was much simpler, requiring no skill or training in dressings. It consisted of simple wet packs of Thiersch's (borosalicylic) or Burow's solution (aluminum acetate) changed daily. While the wounds never responded as they

did under Carrel irrigations, they were sufficiently clean after a few days to warrant secondary closure.

For, in determining whether a wound was ready for closure, according to later technique, the author learned to rely not so much on bacterial counts and cultures, as on clinical appearance. He often sutured wounds whose bacterial counts showed "infinite" numbers of bacteria per field with good results. In following the technique described, he found that sterility of the wound was not an essential factor for safe closure. Occasionally, when in doubt as to whether suture was safe, cultures were taken, and if streptococcus or gas bacillus was present, he refrained from closing.

The methods of closure were three in number: First, closure according to the Carrel technique, which should be performed only when "sterility" of the wound is certain; second, closure after denudation or complete re-excision of the wound; third, when the latter was not feasible, closure after curettage of all fresh granulation down to the thin film of scar over the bare muscle. By far the greater number of wounds were closed according to the second method.

The Carrel method of suture was applied to those wounds that had received preliminary Carrel-Dakin treatment and had been rendered "sterile." The skin was carefully cleansed with benzine and ether. Granulations were not touched—no iodine was used. The newly formed skin edge was dissected off for about one-eighth of an inch. The skin flaps were lifted on either side, preferably by blunt dissection, and the wound sutured by interrupted silkworm-gut sutures, passing only through skin. No deep sutures were inserted. The main technical difficulty lay in the fact that as the granulations which filled up the wound cavity were not exercised, there was often great tension in bringing the skin flaps together across the wound. The results, even in the early cases, were not brilliant, first because of the difficulty in closure across the granulating surface, particularly in the wider wounds; secondly, about 50 per cent of his cases became infected for one of the following reasons: either the wound surface was not sterile, or there were small cysts of pus under the flat surface of the granulation. In the latter event the surface might have looked perfectly clean and given negative bacterial counts. This observation was repeatedly corroborated in his later work, when secondary denudation of the wound became a routine, and he repeatedly found these small encysted areas of pus under the wound surfaces.

The second method of suture was used after preliminary treatment with Dakin's solution or ordinary wet dressings. As soon as the wound looked clean, it was ready for suture according to this method. The skin surrounding the wound and the granulations were thoroughly iodinized. Then, beginning at one angle, the skin edges and the granulations were dissected off, if possible in one piece, performing practically a denudation or secondary excision of the wound. As far as possible the granulations were not handled, and the knife and forceps used in dissection were immediately discarded. (It was during this dissection that the small subsurface accumulations above mentioned were discovered.) There was then left a clean muscular or fascial surface for suture. The skin was then dissected up on either side, sharply, as far as necessary to effect coaptation across the wound. As a rule the skin did not require as much dissection as when the granulations were not removed. The wound was then thoroughly flooded with pure ether and sponged until dry. Whenever possible fascia was sutured separately, thereby relieving tension on the skin sutures. Anatomical layers showed very clearly and suture could be performed along anatomical lines. In wounds that were difficult to close because of size or irregularity, separate fascial sutures lent considerable assistance to the final skin suture. According to this method it was only rarely that even the largest wounds

could not be closed. Silkworm-gut sutures were used for the skin.

In the rarer cases where, owing to the depth of the wound, or the exposure of an important vessel, the granulations could not be dissected off, he resorted to the curette. The instrument when used gently was perfectly safe, and it peeled off deep granulations very easily. It seemed as if there was a distinct line of cleavage between the thin film of scar of the deeper portions of the wound and the overlying granulations.

Results were very much better than after suture according to the Carrel technique where granulations were not removed. Occasionally there were slight infections easily controlled by wet dressings, and even when suppuration occurred the release of one suture and slight drainage sufficed to clear up the infection, without impairing the suture line. Entire breakdown of the suture line was exceptional. Primary union was the rule.

The advantages of this method are obvious. It is not necessary to wait for sterile surfaces, the preparatory treatment can be carried out by untrained assistants, better anatomical approximation is secured, and infections are less common.

Lastly it was possible to allow wounds to heal without suture. Healing progressed more favorably under Carrel dressings than under any other. However, this method wastes considerable time and the functional result is less favorable. Even if it was impossible to suture a large wound completely, it was more efficient to suture it partly and graft the rest.

Experiences tend to show that results are more certain and the percentage of union greater when secondary denudation or excision of granulation is performed. In addition, this technique obviates the necessity of waiting for complete sterilization of wounds, which is so uncertain and often unobtainable under war conditions. There is no doubt that, when possible, sterilization should precede suture, but even in sterile wounds he believed that it was better to excise granulations than to suture over them.

When the exigencies of the service are such that haste is an essential factor, and the organization is too small to carry out sterilization of wounds successfully, then one must be content with a method that permits suture of a large number of cases with speed and safety. During the last three months of active work at Base Hospital No. 3, A. E. F., the latter method was used almost exclusively, with the result that the average stay of patients in the hospital was considerably diminished. Rapid evacuation of the wounded was absolutely essential during this period. There was a constant cry for beds, "make room," "get your patients out," and this could only be done by evacuating to the United States the cases requiring long periods of treatment and by early suturing of the simpler cases and their discharge to convalescent camps and to duty.

AN INVESTIGATION OF THE END RESULT IN ONE HUNDRED AND TWENTY-FOUR CASES OF BLOOD TRANSFUSION.

W. GRANT WAUGH (*Medical Record*, Aug. 23, 1919) records the results obtained in a series of blood transfusions carried out in a base hospital in France between November, 1916, and October, 1918, with a comparative table of the results in cases of as nearly as possible identical nature, treated before blood transfusion was available. The method employed was that of indirect transfusion by Vincent's paraffin coated tube, because at that time the citrate method was not available. Compatibility was established at first by direct comparison of the bloods under the microscope and later by obtaining Group IV donors by the convenient microscopic method introduced by Lee. The main indications for blood transfusion in a base hospital are, according to the writer: (1) severe secondary hemorrhage; (2) preliminary to high amputation of the thigh or arm; (3) certain cases of pyemia. The primary indication for transfusion, surgical shock, is much less frequent at the base than at clearing station. As a result of his experience he could not

subscribe to the view that secondary hemorrhage is rarely accompanied by shock. The amount of blood employed was usually 600 Cc., but amounts of 900 to 1200 Cc. have been injected as the condition of the patient demanded. The donor's blood pressure usually fell about 10 mm. Hg., but recovered to normal within an hour. Incompatibility was met with on three occasions. In two of these transfusion was abandoned, no ill effects persisting; they were probably due to faulty comparison of the bloods (these cases were not included in the series). The third case occurred in a man suffering from pyemia who was being transfused for the third time. In addition to emphasizing the necessity for ascertaining the symbiosis of the two bloods before every transfusion, this case seems to indicate that incompatibility may develop as a result of multiple transfusion. Incompatibility usually declares itself after 10 Cc. of blood have been injected; in this case injection had proceeded for a considerable time before any symptoms appeared. The examination suggested by Bond is that "a definite alteration has been found to occur in the direction of increased hemagglutinin content of the blood in the interval between the two transfusions," and that this was responsible for the unfortunate result. Of 52 cases of secondary hemorrhage, with ligation of the main artery, that were transfused 35 recovered and 17 died, a death-rate of 32.7 per cent, while of 52 similar cases not transfused 28 recovered and 24 died, a death-rate of 46.1 per cent. Of 14 cases of secondary hemorrhage following amputation of a limb transfused, 10 recovered and four died, or a death-rate of 28.5 per cent; of 14 similar cases not transfused, seven recovered and seven died, a mortality of 50 per cent. Of 39 cases of sepsis or gangrene, with amputation of the limb, which were transfused, 35 recovered and four died, a death-rate of 10.2 per cent; of 29 similar cases not transfused, 20 recovered and nine died, a mortality of 31 per cent. Of 19 transfused cases of pyemia, 12 recovered and seven died, a death-rate of 36.8 per cent. In the entire series the mortality among the transfused cases was 25.8 per cent, while among those not transfused it was 42.2 per cent. The writer therefore believes the number of recoveries in these very severe cases justifies an extension of the method as a therapeutic measure and thinks it reasonable to hold that it should come into general use in civil practice as a preliminary to any severe operation.

TREATMENT OF HERNIA BY MYOPLASTY.

CHAPUT (*La Presse Médicale,* No. 34, 1919) advises in the treatment of large hernias incident to the thinning and weakening of the abdominal wall transplantation of the tensor vaginæ femoris and its covering fascia, finding this, in spite of the long incision required, a safe, comparatively easy, and efficient procedure. He also uses the Sartorius, but says it is open to the objection that at times it leaves a painful scar. The direct hernias of the aged, due to a weakened musculature and weak and atrophied fascia, do not lend themselves to the Bassini operation. Prompt recurrence, if not the rule, is at least annoyingly frequent. Chaput gives no figures to sustain his assertion that a musculofascial transplant is entirely satisfactory from the standpoint of permanency of cure, though he quotes individual cases apparently demonstrating the value of the method. His technique is given in some detail.

THE ACTION OF CHEMICAL AND PHYSIOLOGICAL ANTISEPTICS IN A SEPTIC WOUND.

FLEMING (*British Journal of Surgery,* July, 1919) in an admirable paper on this subject, abundantly and helpfully illustrated by both slides and graphs, comes to the conclusion that none of the so-called antiseptics which are commonly used are capable of exercising any appreciable bactericidal action in an infected wound. The author has shown that they are incapable of sterilizing

a glass tube with one or two processes much smaller than the diverticula to be found in a gunshot wound; much less would they have any sterilizing action on a wound with infected walls (as all wounds have when the infection has become established). The author has also shown that when put into a comparatively clean wound they have no sterilizing action. Also, that when a perfectly clean flat granulating wound without diverticula is washed with these antiseptics and impression cultures are made before and after the application, there is no reduction in the number of microbes which develop in the cultures, but, on the other hand, there is usually an increase in the number of colonies owing to the destruction or removal of the chief natural means of defense, namely, the leucocytes.

It is noteworthy that the antiseptic which has the most marked inhibitory power on the growth of microbes in a serous fluid should have been found unsuitable for the continued treatment of a wound. Of all the antiseptics in common use there can be no doubt that flavine exercises the most powerful inhibitory action on the growth of microbes in serous fluids; yet it has been generally found in France that this bactericide was not suited for the continued treatment of an infected wound. This is, in all probability, due to its very strong and continued action in destroying the leucocytes in the wound. It was introduced partly because it was supposed to be innocuous or almost innocuous to leucocytes; but it has been shown that it is a slow-acting but extremely powerful leucocidal agent, destroying them in twenty-four hours in as great a dilution as 1:2,000,000. The result of this seems to have been that all reparative processes in the wound come to a standstill.

Eusol and Dakin's solution, on the other hand, have found very many supporters in the treatment of wounds in which the infection has become established. Fleming has seen that when these are put into a wound the active agent disappears in a few minutes, after which the natural defensive mechanism can proceed unhindered. These solutions also cause a mild irritation in the wound, which results in a greatly increased flow of lymph from the tissues, thus imitating the tissue-draining character of hypertonic salt solution. The exudate, after the application of these fluids, also has a very low antitryptic content, thus favoring the tryptic digestion of the sloughs. The bactericidal action of these solutions in a septic wound appears to be negligible.

There is given a graphic illustration of the result of the application of Dakin's solution to the wound in so far as it could be tested. This shows that whilst as regards the amount and the antitryptic power of the exudation there were marked changes, yet as regards the number of bacteria in the exudate before and after the application of the fluid there was no change. In view of this, it is not unreasonable to assume that the benefit which the wound derived from the application of Dakin's solution was due, not to its bactericidal action, but to its stimulation of the physiological processes occurring in the wound.

The only other agent which has obtained any great measure of support in the later treatment of infected wounds has been Rutherford Morison's B. I. P. P. This is not in itself a bactericidal substance, and in contact with tissues or tissue fluids it has no bactericidal action, so it has no toxic or repellant action on the leucocytes, and it can easily be demonstrated that these will emigrate in large numbers on to a surface to which B. I. P. P. has been applied. When a wound is washed with a solution of the common antiseptics, the number of colonies which develop in an impression culture is greater after the washing than before. Rutherford Morison has always insisted that after surgical treatment of the wound and the application of B. I. P. P. the wound should not be touched for a considerable time, and it is possible that much of the success of this treatment has been due to leaving the wound alone. The actual infection would then be dealt with by the leucocytes. It is possible also that the greasy nature of the application prevents the shut-

ting up of the discharge which would take place in a wound left alone after treatment with a watery fluid. If this were so, then pastes containing substances less poisonous than bismuth and iodoform would give equally good results, and certain reports seem to show that this is the case.

In view of these observations the antiseptics at present in use will only exercise a beneficial effect in a septic wound if they possess the property of stimulating or conserving the natural defensive mechanism of the body against infection.

If such a thesis be true, then it brings the "antiseptic" and the "physiological" treatments to the same basis, and it also makes it necessary, in the estimation of the value of an antiseptic, to study its effect on the tissues more than its effect on the bacteria.

It has often been said that the war wounds contain already so many microbes that it is little use taking extreme precautions regarding their treatment, as a few microbes more or less will make no difference. The effect which certain microbes have in stimulating the growth of B. Welchii has been shown graphically, and it has been shown that almost all the microbes which constitute the primary infection of the wound, or which are put in later by the surgeon or the sister, have a mutually beneficial symbiotic action upon each other. It follows from this that even where the wound is apparently badly infected, the same care should be exercised in the dressing as would be taken if it were a sterile one. It has been shown that Streptococcus pyogenes, which is responsible for most of the severe sepsis in the later stages, and causes more deaths from sepsis than all the others put together, is present in only 15 per cent of the wounds when they arrive at the clearing stations.

This organism is present in about 20 per cent of cases when they arrive at the base, where they have been sent on immediately after excision and packing of the wound. After they have been at a base hospital, however, for more than a week, Streptococcus pyogenes is present in almost all the wounds. It would appear, therefore, that faulty technique in dressing the wounds was responsible for the almost universal presence of this the most dangerous of all the microbes found in the wound. The only way to avoid this spread of infection is by the most careful technique in dressing and by the lavish use of antiseptics outside the wound. All these antiseptic solutions are powerful bacterial agents in a watery medium, and outside the body the strength can be increased, as no question of damage to the tissues comes in here. In civil hospitals the equipment is such that sterilization by heat has largely displaced sterilization by antiseptics, but in military hospitals in the field the equipment is, of necessity, more primitive, and there sterility can only be obtained by the lavish use of chemical antiseptics.

In connection with the prophylaxis of infection, we have the question of early treatment of the wound before the infection has had time to grow out and while it is confined to the cavity of the wound. There is no question about the efficacy of early and thorough surgical treatment; that has proved its value without a doubt. There has been controversy, however, regarding the value or otherwise of chemical agents as adjuncts to this surgical cleansing. An experiment was carried out about a year ago at No. 10 Casualty Clearing Station in which primary suture was done on wounds excised and treated with various agents. The results obtained are shown in graphic form, from which it will be seen that there is no great difference between the number of successes whatever the method of treatment. It is true that the largest percentage of successes was in the group sewn up without the application of any antiseptic; but this is explained away by saying that in most cases the surgeon only dared to sew up wounds in this way when they were not very serious. It has been found in several large series of delayed primary sutures that the results were practically identical whether the wound had been packed with gauze soaked in an antiseptic or whether plain

gauze had been used as the primary dressing after excision of the wound at the casualty clearing station.

It is very difficult for the surgeon not to be deluded into the belief that he has in the antiseptic a second string to his bow, and consequently it will tend to make him less careful in his surgical treatment of the wound. If he knows that he has nothing to fall back on, then even with the most conscientious individuals the surgery would improve. Because of this alone it would be well if the treatment of the wound with antiseptics in the early stage were abandoned and the surgeon relied on his skill alone. All the great successes of primary wound treatment have been due to efficient surgery, and it seems a pity that the surgeon should wish to share his glory with a chemical antiseptic of more than doubtful utility.

DISAPPOINTMENTS AFTER GASTRO-ENTEROSTOMY.

MOYNIHAN (*British Medical Journal*, July 12, 1919) states that this operation, carried out in appropriate cases by a competent operator, is probably the most successful of all surgical procedures of equal magnitude, and it is certainly among the safest. In his last series of 300 non-malignant cases he did not lose a patient; and in recent years a temporarily unsatisfactory result has been extremely rare.

When we speak of disappointments after gastroenterostomy, we must first remember that it may not be the fault of the operation, but of many other circumstances, if things go wrong. The success or failure of an operation may be due not only to the procedure itself, but also to its performance in cases which did not need it.

The operation has been performed in the absence of any organic lesion justifying it. This is by far the most frequent cause. In every ten cases of unsatisfactory results nine are due to this cause, and to this alone. The conditions for which the operation has been needlessly performed have been: functional disease of the stomach, chronic disease elsewhere, cholelithiasis, carcinoma of the gall bladder, cirrhosis of the liver with hemorrhage, splenic anemia, tabes dorsalis, disseminated sclerosis, the vomiting of pregnancy, lead poisoning, prolapse of the kidney, colonic adhesions, and epigastric hernia.

It appears to be still a custom in dealing with duodenal and gastric ulcer to perform gastroenterostomy only, leaving the ulcer itself untouched, and making no search in the abdomen for other conditions. As these ulcers are probably often, if not always, secondary to some infection which may exist within the abdomen, such a search should be a necessary part of every operation, provided that the condition of the patient will warrant it. Chronic appendicitis is very frequently associated, probably in a causal relation, with ulcers of the stomach and duodenum. It is better, therefore, always to remove the appendix. The division of the membrane which causes a "Lane's kink" may also be practiced. The gall-bladder should always be examined for the presence of stones, or of that subserous deposit of fat, especially near the pelvis, and the cystic duct, which is the first sign visible from the exterior of an infection of the walls of the gall-bladder from within. Either the removal of stones and drainage of the gall-bladder or removal of the gall-bladder may be necessary.

But above all the ulcer itself should be dealt with in such manner as to insure that all large vessels running into it are ligatured, and that the risk of subsequent perforation is lessened or prevented by the infolding of the ulcer, and by the covering over of the first part of the duodenum by the two omenta. Cases of fatal hemorrhage from a duodenal ulcer, weeks or months after gastroenterostomy had been performed, are recorded by Kocher, Quenu, Sir F. Eve, and others. And Mr. Corner has related the story of the fatal perforation of a duodenal ulcer in a patient whom the author had operated three years before. Other cases of perforation in similar

circumstances are known to the writer, and some are recorded in the literature. Merely to perform gastroenterostomy in cases of duodenal ulcer is therefore to leave open many chances of subsequent disaster. A direct dealing with the ulcer is always necessary. In patients upon whom gastroenterostomy alone has been performed, there may be a recurrence of all the original symptoms of duodenal ulcer. In such cases one of two conditions is present—either a jejunal ulcer, or a revival of activity in the duodenal ulcer. If the latter, the infolding of the ulcer, and its protection by a double covering of the omenta, will remove the symptoms at once. An *x*-ray examination before the operation will probably show that much of the food passes by the pylorus.

The infolding of the ulcer of course narrows the pylorus for a time at least, but it is not with the object of producing obstruction that the infolding is done. As A. B. Mitchell has shown, the infolding ulcer very rapidly disappears.

The operation has been performed, rightly or wrongly, and certain technical errors cause distressing symptoms—pain, vomiting, diarrhea, etc.

The chief of these occur when the anterior or the posterior operation has been performed, and a long jejunal loop has been left. This loop may, with difficulty, be emptied; it may become "waterlogged," and an obstruction may develop at the afferent opening into the stomach. "Regurgitant vomiting" occurs, only to be relieved by lavage, or in severe cases by the performance of an enteroanastomosis, which checks it at once.

With a short or a long loop, the efferent piece of jejunum has been blocked as a consequence of a kink, or from adhesions, between the intestine on the one side, and the abdominal wall, omentum, transverse colon or mesocolon, and loops of small intestine on the other. Regurgitation occurs here also. Regurgitant vomiting means high intestinal obstruction.

A short-loop posterior gastroenterostomy has been performed. At the time when the jejunum was lifted up to oppose to the stomach before suture, adhesions were found binding it to the under surface of the transverse mesocolon, an exaggeration of the ligament of Treitz. These were divided and a raw surface left on the jejunum, proximal to the opening made to anastomose with the stomach. Adhesions then formed and caused obstruction of the proximal part of the jejunum between the duodenojejunal flexure, and the opening into the stomach. Mr. Nicoll of Glasgow describes this condition.

The jejunum has been rotated round its longitudinal axis at the time when it has been approximated to the stomach. This twist may be quite enough to cause an obstruction.

The opening is too small. Moynihan has operated upon patients suffering from pyloric obstruction when a short-circuiting operation had been performed a few months before, and has found the opening too small to admit the tip of the little finger. A gastroenterostomy opening should always be large; not less than 2½ inches in length.

The opening is badly placed. The opening should always reach the greater curvature and is best placed in line with the esophagus. Whether the jejunal direction is vertical, or inclines from left to right, or right to left, matters very little.

Moynihan has not only found the opening originally made too small, but lying midway between the curvatures, and in one case actually on the lesser curvature at the incision. In such cases an *x*-ray examination will show the existence of a pool of unemptied stomach contents below the anastomosis. By manipulation the stagnant fluids can be pressed out of the anastomotic opening.

There has occurred a hernia of the small intestine through the unclosed rent in the mesocolon. In one of the author's early cases (in 1902) he did not stitch the cut edges of the opening, made through the transverse mesocolon, to the suture line. A great part of the small intestine escaped

through the opening into the lesser sac and became strangulated; the patient died. It is important to close the opening in the mesocolon very carefully. One of the ablest surgeons in the world told the writer of a case in which he did not suture the opening very completely, leaving a gap at the proximal end of the jejunum. A small knuckle of bowel crept in and became strangulated. An operation on the fifth day revealed the condition. The patient recovered.

The edges of the mesocolic opening should be sutured either to the stomach or to the suture line. If they are attached to the jejunum alone the stomach may withdraw into the lesser sac, and so cause a kink or obstruction near the stoma.

The use of unabsorbable sutures—silk, linen thread, thick chromicized catgut—may be the cause of subsequent trouble. The work of Wilkie seems to show that catgut is to be preferred to any other suture material. It remains long enough to insure firm union between the viscera, and disappears in a few weeks' time. The catgut should be as fine as is compatible with adequate strength. Moynihan uses the finest chromic gut for both sutures.

In many cases of hemorrhage occurring some weeks or months after the operation the liberation of an unabsorbable suture may be the cause. Such sutures may be seen hanging from the line of anastomosis when later operations are performed. Moynihan has found a piece of stout chromicized catgut three years and nine months after the original operation. Of the two sutures it is certain that the outer one, the sero-serous, is the one so long retained. The inner stitch, which apposes the cut edges of the mucous membrane, is probably always discharged within a very few weeks, whatever the material of which it is composed. The use of linen and silk is perhaps responsible in some degree for the development of jejunal or gastro-jejunal ulcers. The sutures have to work their way out, and so delay healing, or start an ulcer at any point. He has twice found small ulcers near the retained knot of an unabsorbable suture.

Late complications in the form of ulcers may develop after an operation performed, in a case requiring it, without any technical flaw. This is by far the most serious of all the sequels of gastroenterostomy. The ulcer may be at the suture line, or near it; it is generally small, and as a rule is single.

Its causes are not known with certainty. Among them are, probably, the use of unabsorbable sutures, inaccurate apposition of mucous membrane, bruising of the part of the viscera embraced by clamps with the result that a hematoma forms, a continuance of the cause of the original duodenal or gastric ulcer, and a persisting hyperchlorhydria.

It may at least be said that an avoidance of these faults or treatment of these conditions will almost certainly prevent the development of any fresh ulceration. The diagnosis of jejunal ulcer is not as a rule at all difficult. There are several clinical types which the author has described in his book Abdominal Operations. There are several methods of operative treatment, not all of them satisfactory and some of them very difficult. Recently Moynihan had performed partial gastrectomy in such cases, removing the stomach up to the proximal side of the anastomosis, and all that part of the jejunum engaged in the junction.

The proximal end of the distal limb of the jejunum is closed and the side of it united to the cut end of the stomach; the distal end of the proximal segment is united to the distal portion of the jejunum just below the anastomosis with the stomach. The writer has known jejunal ulcer to develop in two patients after gastroenterostomy performed in the absence of any lesion in the stomach or duodenum.

This may occur after an operation which has, for a time, seemed perfectly successful. The author stated that he had in his wards a patient upon whom he performed gastroenterostomy for chronic gastric ulcer thirteen years ago. At the time of the recent operation a carcinomatous ulcer was

present at the site of the former simple ulcer. In earlier days he has met with several cases in which malignancy developed at the site of a chronic ulcer after operation. In the cases in which the cancer is found within, say, three or four years it may fairly be argued that the growth was present at the time of operation, for gastric cancer may increase very slowly. But in cases occurring later than this the great probability is that the change from a simple to a carcinomatous condition has taken place.

Nowadays he performs, as a rule, only two operations for cases of chronic gastric ulcer. If the ulcer is not near the esophagus, and is of average or small size, he performs partial gastrectomy. If the ulcer is very large, burrowing deeply into the liver or the pancreas, and near the cardiac end of the stomach, he performs gastroenterostomy in Y; and into the proximal limb of the jejunum, below the duodenojejunal flexure, he introduces a tube, performing jejunostomy. Through this tube the patient is exclusively fed, for few or many months, until an *x*-ray examination suggests that the ulcer is healed.

In the case of the largest gastric ulcer he has ever seen, the ulcer occupying the whole of the lesser curvature and extending deeply into the liver, the patient did not take one spoonful of food or drink by the mouth for two years and nine months. He gave her permission to do so at the end of two years, when the ulcer appeared to be healed, but she prolonged at her own desire the period of jejunal feeding for nine months.

The remembrance of her intense suffering before the operation, and her perfect comfort and satisfaction when she took food only by the tube, weighed with her in making this decision. The jejunostomy opening has been closed for nearly three years, and she remains perfectly well, free from pain, and is now 4 st. heavier than when the original operation was performed.

The symptoms present in cases of unsuccessful gastroenterostomy are chiefly four—pain, vomiting, hemorrhage, diarrhea.

Pain may be due to a revival of activity in an unhealed ulcer; the presence of a jejunal ulcer; adhesions crippling the proper action of the stomach or jejunum; the presence of some other disease which has been overlooked at the operation—chronic appendicitis, cholelithiasis, and the other diseases enumerated above.

Hemorrhage may be due to the separation of a suture; continuing activity in a duodenal or gastric ulcer; a jejunal ulcer; the presence of some other disease which has been overlooked, such as splenic anemia, cirrhosis of the liver, etc., as enumerated above.

Vomiting may be due to obstruction as a result of any of those technical defects in the operation which Moynihan has already named functional causes.

Diarrhea may be due to too rapid emptying of the stomach; some pathological condition of the intestine, or other viscera, which has been overlooked; the offensive character of the escaping contents.

The too rapid emptying of the stomach is sometimes a cause, or is supposed to be the cause, of many discomforts, intestinal uneasiness and turmoil, and diarrhea. When a patient suffering in this way is examined by the *x*-ray the stomach is seen to empty itself very rapidly—perhaps in ten or twenty minutes, the food flowing through the opening into the intestine simply by the act of gravity. In the great majority of such cases that have come within Moynihan's knowledge the operation of gastroenterostomy should not have been performed. The stomach which acts or fails to act is generally a feeble, flabby, atonic organ, capable of exercising little or no control on its contents. The fault here is due to the performance of the operation in an unsuitable case. The jejunum below the opening in such cases appears, by *x*-ray examination and on inspection, to be dilated as a result of the rapid filling; its distention may be the cause of great distress.

The enumeration of all these untoward events in connection with the operation of gastroenterostomy appears very formidable. But compared with the excellent results of

the operation performed in appropriate conditions, and in a skilful manner, the disappointments are nowadays extremely few. Many of the errors to which allusion has been made are probably things of the past. For their avoidance the greatest care in preliminary investigation is necessary. The diagnosis of duodenal ulcer is rarely difficult; the diagnosis of gastric ulcer is never easy. A very large majority of patients supposed to be suffering from "gastric ulcer" are in truth suffering from other diseases. There is only one unequivocal method of diagnosis in cases of gastric ulcer, and that is by *x*-ray examination. The clinical symptoms are very treacherous.

But when the operation is begun no clinical diagnosis, however confidently made, can stand against the conditions revealed then to the hand and eye. If an ulcer is not seen and cannot be demonstrated, it does not exist, and therefore no operation designed for its cure or relief should be performed. A search must then be made elsewhere. And remembrance should always be given to the associated and interrelated actions of such organs as the liver, spleen, pancreas, and the alimentary canal.

CANCER OF THE STOMACH.

HARTMAN (*American Journal of Surgery*, September, 1919) observes that the usual contraindications to operation come from the recognition of the general conditions, such as the presence of ascitic fluid in the abdomen, an abnormal enlargement of the liver, enlarged supraclavicular or inguinal glands, a neoplastic induration of the umbilicus, the existence of solid tumors of the ovary. In their absence, unless the patient is absolutely cachectic, it is permissible to open the abdomen and to determine by direct examination whether the tumor can or cannot be extirpated. Unfortunately, in a number of cases, we find extirpation impossible, but even here we may often establish a gastroenterostomy, which if it does not cure the patient will correct the accidents connected with gastric stasis, preventing the vomiting, diminishing pain and procuring a certain amount of comfort which will allow the unfortunate victim of cancer to pass away slowly and more comfortably as the weakness becomes progressive.

Sometimes even the improvement is such that for months patients may think themselves cured, and hope for prolonged life. In general, the usual term of life is about six months and a half.

The technique of operation he advises is as follows: After having cut through the smaller omentum in the part which is only moderately vascular, and opened the greater omentum sufficiently near to the stomach so as not to injure the mesocolon, and to be sure, by direct exploration, of the possibility of an extirpation, the surgeon may undertake the resection. Lifting up the liver, the stomach is drawn down, the falx of the coronary is ligated and severed, drawing down the lymphatic ganglia which are found at this level. The rubber-covered clamps having been placed on the stomach as near as possible to the cardia, the surgeon cuts this viscus between the clamps, throwing it to the right, thus removing almost the whole of it to the right, and thus removing almost the whole of the smaller curvature. A thrust made with a sound into the duodenopancreatic furrow bares the gastroduodenal artery, which can be ligated all the more easily, because it is isolated—the vein leaves the artery to run along the lower border of the pancreas, joining the superior mesenteric vein. There remains now, to complete the resection, but to separate the pylorus from the great omentum and to divide the duodenum. It is necessary to divide the great omentum at a certain distance from the stomach, in order to remove with the tumor the subpyloric ganglia, which, unlike those of the lesser curvature, are not in immediate contact with the stomach.

We must remember these ganglia may adhere to the transverse colon, and that it is necessary to proceed with great care, because it is at this level that we find the

great anastomotic vascular arcade of the mesocolon. With the pylorus, the retropyloric ganglia can be removed since they can be easily separated from the pancreas, and without bleeding, thanks to the preliminary ligature of the gastroduodenal artery. The operation is terminated by one of the gastrointestinal anastomoses, either by a gastroduodenal implantation or by a gastroenterostomy.

The author prefers these methods of anastomosis to the end-to-end operation recommended by Billroth, for in view of the difference in caliber between the duodenal section and the gastric section the surgeon is obliged to make a Y suture.

The technique which the author has described appears to be that which has given the greatest number of definite cures. We should not, however, think that less complete operations have no advantage. William Mayo advises excision of gastric cancers, even when the ganglionary masses cannot be removed. It is certain that the improvement obtained by such operations is much superior to results obtained from a simple gastroenterostomy. In such cases we can follow the technique of Temoin. He makes no preliminary ligations of vessels, relying on the fact that the arterial trunks (gastro-epiploic, coronary, pyloric) are not attached to the stomach, but send smaller vessels through it which run through the serous and muscular coats, then pass through to branch out in the cellular tissue; he therefore contents himself with drawing the stomach out of the abdomen, rubbing with a compress the anterior and posterior walls in order to isolate these vessels. The small ramifications tear without any resistance, and the slight flow of blood which results is stopped almost immediately. This maneuver repeated over the vessels of the larger and lesser curvatures allows us to detach the great vessels as far off as is necessary to do the excision. Although the operation of Temoin is an incomplete operation and leaves in place the glands, results have been fairly good. Simple gastroenterostomy, while an excellent palliative, appears to be destined to more and more restricted application, in all cases where the stomach can be mobilized, where consequently excision is technically possible.

OTOSCLEROSIS.

PRATT (*Minnesota Medicine*, October, 1919) observes that a classical otosclerosis would have the following symptoms: Gradual deafness; tinnitus present; paracusis present; absence of chronic tympanic disease; patent Eustachian tubes; lower tones raised, higher tones nearly normal; Rinne-Gelle negative. One could hardly miss a diagnosis with these signs present, which signify an otosclerosis with fixation of the stapes. If the bone changes have affected other parts of the labyrinthine capsule, the diagnosis becomes more difficult. The flushed spot on the drum over the promontory might be caused by middle-ear congestion and a thin membrane, so it could hardly be a classical sign.

Some have lost view of the fact of seeming heredity; that it progresses rapidly, then will seemingly be dormant for a number of years, or become a little better; that it can be complicated by other ear diseases, which when removed leave us with the fundamental otosclerotic condition; that these patients are nearly always past middle life and have the appearance of being poorly nourished, or in poor physical condition, and yet claim that they are feeling as well as usual.

In the pathology of this condition, we know that there are certain changes in the bone surrounding and including the internal ear. First a softening and absorption, then a return to a new bone condition, followed by a sclerosis. This condition existing in any or all parts of the bony labyrinth, as well as the other bones in the same individual, points to the fact that there is some disturbance in the control governing nutrition of tissue. We know that strong and weak glands and organs are transmitted, for we know they run in families. We have to look for a disturbance in the secretion of the substance that controls

these conditions, and this seems to point to the internal secretions.

If the hypothesis that hyposecretion of the ductless glands influencing bone metabolism is a cause of otosclerosis, and we are unable to find any focal infection, or other cause affecting the secretion of these glands, the line of treatment would be to supply this deficiency until conditions would become favorable for establishing normal secretion.

As a result of ductless gland therapy Pratt reports some distinct betterments, not so convincing as to lead to the conviction that a cure for this hitherto resistant affliction has been found, but suggestive of a line as likely to be fruitful of result as any yet proposed.

STIFF AND PAINFUL SHOULDER.

BROWN (*Surgery, Gynecology and Obstetrics*, October, 1919) notes that the three significant signs which point to a disability due to a tear of the fibers of the teres major and latissimus dorsi tendons, other conditions being ruled out by careful examination, are:

Pain when the involved muscles are placed on the stretch by the motion of abduction and external rotation in the abducted position.

A definite point of tenderness in the tendons of the muscles at or near their attachment to the bone.

In the subacute or chronic cases atrophy of the deltoid muscle greater than that from disuse; occurring without demonstrable gross nerve lesion.

In the acute stage which is encountered immediately after the receipt of the injury and the onset of the symptoms, the shoulder will do better with rest in such a position that the torn edges of the tendon will remain in apposition. This will be the sling position. Active motion may be begun the day following injury in definite periods of fifteen minutes each, carried out three or four times a day. Active motion should always be kept within the limits of pain. Splinting the muscle as recommended by Jones cannot be carried out in this condition because of the anatomical arrangement of the muscles injured, but splinting the deltoid by an adhesive plaster strap placed tightly across the muscle at right angles to the direction of its fibers just above its insertion into the humerus will inhibit abduction and so lessen the danger of stretching or tearing the involved tendons.

As the object of treatment is to accomplish early absorption of the extravasation and subsequently bring about the formation of a scar with a good blood supply, massage will be found of great value. The massage in acute cases should be gentle and in the main directed to the injured part. General massage of the surrounding muscles may be used to advantage to keep up their tone during the period of inactivity and to guard against the development of local myositis, which is apt to occur in muscles which have been subjected to trauma and then are allowed to remain inactive. Massage should be used daily, is best performed by the surgeon himself or by a trained masseur, should always be gentle and kept within the limits of pain.

In the acute stage, then, the treatment consists in immobilization for a short time; active motion begun early for short periods and always within the limits of pain; prevention of new insults to injured or healing structures by splinting the deltoid and inhibiting motion tending to cause such insult (any motion which does not cause pain may be freely used and will serve to keep up muscle tone); and local and general massage intelligently employed.

In the subacute stage the treatment is essentially the same as in the acute except for the immobilization. In this stage the patient is encouraged to use the shoulder as much as possible, but always within the limits of pain. A little time taken in the examination of this type of shoulder will discover movements which can be performed without pain. These motions should be pointed out to the patient and he should be encouraged to practice such movements faithfully. Massage should be used and may be more vigorously applied, as the

object in this stage is to promote a new blood supply in scar tissue which is at least partly formed—a more difficult process than where the reparative tissue is forming as in the acute condition.

In the chronic and more severe cases it is necessary first to break up the firm scar and fibrous tissue which has formed in the tendons and the adhesions which have formed in the surrounding axillary tissues; also to overcome the shortening of the muscles which has taken place as the result of carrying the arm in the sling position for a considerable length of time. This is best accomplished under an anesthetic. This transforms the condition to one comparable to a case in the acute stage, and should be treated accordingly.

A PRELIMINARY REPORT UPON THE TREATMENT OF HAY-FEVER BY ALCOHOLIC INJECTION.

TROWBRIDGE (*California State Journal of Medicine,* August, 1919) states in regard to his first case that the reaction was so great that the patient thought he was ruined for life and suffered much more intensely for a few days than he had previously. However, much to his surprise after about ten days, his symptoms entirely disappeared and he has never had a return of the trouble to the present date.

At the present time after treating 60 or 70 cases he is much surprised if the patient be not relieved. He makes the injection directly into the turbinate body, especially the lower turbinate, also into the sides of the septum as well. The treatment is somewhat painful, even though the nasal cavity has been thoroughly anesthetized. There is no pain at the entrance of the needle, but upon the injection of the alcohol into the tissues the patient complains of considerable pain for a few moments at each injection, provided the alcohol is properly injected. Several injections should be made on each side.

There is considerable reaction following the treatment, lasting from two to seven days. Relief from the sneezing is usually immediate. As to the permanency of the cure, it varies with different people. Some cases which he treated four or five years ago have never had an attack since, although they had suffered each spring and summer previous to the treatment. Others are relieved for one season and have a return of the symptoms each year. Most cases, however, seem to be cured permanently.

TRACHEOTOMY WITHOUT LOSS OF BLOOD.

GUTHRIE (*Surgery, Gynecology and Obstetrics,* September, 1919) thus describes his operation based on three different types of tracheotomy:

The preliminary operation in which the patient can be anesthetized and a careful dissection carried out.

In the pulling patient, who needs tracheotomy and not intubation, or in whom intubation has failed to relieve the obstruction. Time can be taken to operate on these patients under local anesthesia.

The extreme case on the point of asphyxiation, who is struggling and fighting for breath, and who must be operated upon without anesthesia.

In the first and second type little or no blood need be lost if the relation of the veins is appreciated. In the third type, if the thyroid ima can be pulled aside successfully no blood need be lost.

If the patient is a child it is wrapped in a blanket or sheet to control its struggling and placed upon the operating table or on a table in the home. A pad of some sort is put under the shoulders and the head is hung over the end of the table, steadied by an assistant. The operator stands on the right-hand side of the table and, steadying the skin with the left hand, makes an incision in the midline of the neck 1½ to 1¾ inches long.

DaCosta gives the distance between the manubrium and cricoid in an adult as 2¾ inches, in a child of ten 2¼ inches, and in a child of six about 2 inches. The incision should not extend down to the sternal

notch but must end one-half inch above it to avoid the arcus of the anterior jugular veins. The skin and the superficial fascia are incised, and the wound held open by a pair of catspaw retractors which should not be more than one inch in breadth. The parallel branches of the anterior jugular veins escape injury if the incision is made in the midline of the neck because they lie to either side of it. The sternohyoid and sternothyroid muscles are separated by blunt dissection. If care can be exercised during this step of the operation, the muscles can usually be separated without injury to the thyroid ima beneath. The retractors are reset. The left blade holds aside the skin, the fascia, and the two muscles; the right blade holds the skin, fascia, the muscles, and the thyroid ima vein. This exposes the trachea. It is incised, the head is straightened, and the tracheotomy tube inserted.

REVIEWS.

A Text-book of Pathogenic Bacteria and Protozoa. For students of medicine and physicians. By Joseph McFarland, M.D., Sc.D. Ninth edition, revised, copiously illustrated. W. B. Saunders Company, Philadelphia, 1919. Price $4.75.

This book has been before the profession since 1896. Not only has it appeared in new editions during that time, but it has also been reprinted on a number of occasions.

In the preface to the ninth edition we are told that "the scholastic quiet of the author's university was invaded by the call of the bugle, the voice of command, and the tramp of marching feet," all of which he thinks was not in the way of aiding scientific thought and writing. He also points out that no less than 250 of our friends in science whose work has been mentioned in the text have become our enemies in politics. He doubts whether this unfriendly feeling in science will persist. While it may be true as the author thinks that men of science form a kind of international brotherhood, nevertheless the readiness with which the men he refers to joined their countrymen in the perpetration of excessive atrocities makes one feel that most of them, whether they be scientists or not, are deserving of what is coming to them, and what ought to come to them, for many years to come.

As the author devotes all of his preface to considerations of this character, he gives little clue to any additions which he may have made in the present issue of his book, except that he states that the copy was prepared from memorandum notes while in base hospitals, and the proofs read and corrected when in similar service.

The book, as our readers will recall, contains more than 850 pages of text, is clearly printed, well written, furnished with a copious bibliography, and clear illustrations. There are also a considerable number of colored illustrations which add materially to its value.

Nervous and Mental Diseases. By Archibald Church, M.D., and Frederick Peterson, M.D. Ninth edition, thoroughly revised, copiously illustrated. W. B. Saunders Company, Philadelphia, 1919. Price $7.

The first edition of this book appeared just twenty years ago, and for a book to have had so many editions, that is, one about every two years, and to have been reprinted a number of times, is a tribute to the fact that it has proved to be popular with the profession in the past.

The authors tell us that no radical changes have been made in the ninth edition, but "some radical views," which they do not mention, but which have attained considerable popularity, have not been incorporated until more experience justifies their inclusion. The chapters upon general paresis and traumatic insanity have been rewritten and corrected. As the preface of the first edition pointed out, the work is not the joint work of the two authors, but is divided into

two parts: Dr. Church dealing with Neurology and Dr. Peterson with Psychiatry. It is closely printed and contains an enormous amount of valuable clinical information; 664 pages are devoted to nervous diseases and about 230 to mental diseases, which is an appropriate division of space between the two subjects, but which, naturally, makes Dr. Church by far the larger contributor.

A Manual of Obstetrics. By Edward P. Davis, A.M., M.D. Second edition. W. B. Saunders Company, Philadelphia, 1919.

This handbook of obstetrics covering 466 pages has been prepared by the Professor of Obstetrics in the Jefferson Medical College, who very naturally dedicates it to the "Students and Graduates" of that institution.

The chief changes in the second edition deal with the differential diagnosis of early pregnancy, the treatment of eclampsia by sedatives, prolapse of the pelvic organs complicating pregnancy, anesthesia and analgesia in labor, and a number of other topics which are particularly interesting obstetricians at this time.

In regard to the treatment in eclampsia we note that the author considers that prophylaxis is more important than treatment of the condition, a fact which is being more and more recognized. He recommends that patients with a high blood tension and stuporous should be bled from 8 to 20 ounces, and that this should be followed by the injection of 16 ounces of warm normal saline; the stomach should be washed out with a solution of bicarbonate of soda or normal salt solution, and from 2½ to 5 grains of calomel and soda left in the stomach. The colon should be copiously irrigated with warm saline solution and from a pint to a quart left for absorption. Careful attention should be given to the bladder, and digitalin or codeine should be given hypodermically. Should convulsions occur and be severe, the author thinks they may be controlled by inhalations of nitrous oxide and oxygen or a small quantity of ether well diluted with oxygen, but he is opposed to the use of chloroform. He discusses the use of the tincture of veratrum viride and suggests that it be given in doses of ten minims and repeated until the patient has a markedly lowered blood-pressure. On the other hand he recognizes that sedative treatment is often dangerous, and we presume that where the blood-pressure is low he would be opposed to veratrum. His general feeling in regard to sedatives, especially morphine and chloral, seems to be adverse.

By virtue of his large experience as a teacher and clinician in hospital and private practice Dr. Davis is well qualified to produce text which can be eagerly and with advantage followed by his professional colleagues.

Venereal Diseases. By C. H. Browning, M.D., D.P.H., and David Watson, M.B., C.M. With an Introduction by Sir John Bland-Sutton, F.R.C.S. Henry Frowde, Oxford University Press; Hodder & Stoughton, London, 1919.

Bland-Sutton states that this book combines admirably the laboratory and clinical methods for recognizing and treating syphilis and its fellow companion, gonorrhea, and that for students and practitioners it is as useful as the Nautical Almanac for mariners. High praise, not without its justification, since the book contains much in a condensed and readily understood form. There are excellent illustrations, many of them colored, and if perchance some of the latter are diagrammatic this does not detract from their teaching value.

As an unusual insert in such a book, and also an extremely useful one, there is a diagram to illustrate the Scheme of Exercise Treatment in Tabes Dorsalis, together with explanatory text.

The authors adhere to the classification of disease under Parasyphilis and give symptoms on which differential diagnosis may be based. They venture no opinion as to the value of the luetin reaction. As might be expected from students of Bland-Sutton, they are strong on pathology. Their treatment is rational and well set forth. The text is admirably condensed, accurate, and modern. A useful book.

A MANUAL OF OBSTETRICS. By John Cooke Hirst, M.D. Illustrated. W. B. Saunders Company, Philadelphia, 1919. Price $3.

This is a small book of 516 pages, with 216 illustrations, most of which are taken from other authors. It is dedicated to the Students in the Medical School of Pennsylvania, and is a companion book to the author's Manual of Gynecology, issued in similar form some time since.

The book is not an exhaustive one, but is a handbook for daily use. The illustrations are well chosen and the author speaks from a large experience as a practitioner and teacher, which makes him capable of presenting only that which is absolutely useful.

STERILITY IN WOMEN. By Arthur E. Giles, M.D., B.Sc. (Lond.), M.B., Ch.B. (Vict.), F.R.C.S. (Edin.), M.R.C.P. (Lond.). Captain R. A. M. C. (Tempt.). Illustrated. Henry Frowde, Oxford University Press; Hodder & Stoughton, London. 1919.

The author considers this book particularly timely in that because of the loss of some millions of young and virile men it is of supreme importance that marriages that are consummated should be fruitful. He regards it as at least a step in the direction of this object if the causes of sterility can be expounded and the measures that are available to remedy deficiencies and remove obstacles can be pointed out.

The first chapter is devoted to Man's Share of Responsibility for Childless Marriages. Giles considers that perhaps 10 to 20 per cent of barren marriages are attributable to the man, and gives the proportion of sterile marriages in England as below 15 per cent: ten per cent among the working population and 16 per cent among the leisure classes. The author gives an excellent classification of the causes of sterility, including sex incompatibility, for which medicine offers no help.

There are chapters on Diagnosis, Prognosis and Treatment, and also a most satisfactory bibliography at the end of each chapter.

The book constitutes an admirable summary of all that is known concerning this important subject, supplemented by a large experience by one who for years has been especially interested in it. The advice given as to treatment is essentially sound.

CORRESPONDENCE.

MALARIA AND THE OLD THEORY.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: That there is another factor as a carrier of malarial infection besides the mosquito there is no doubt. My observation for many years past is that during the autumnal months, when planters begin to plow their lands to plant seed-corn and oats, those living in the vicinity of the disturbed soil have malarial fever of the continued type, lasting from five to eight days. Now these lands are well drained and there are no mosquitoes.

The fever is of morning remission and evening exacerbation; the tongue is white and large, and indented by the teeth. The spleen and liver are enlarged. These cases yield slowly to quinine. Even at the present time certain practitioners in malarious countries dissent from the opinion that the mosquito is indispensable for the spread of the disease. Dr. Roux of the St. Louis Hospital of Jerusalem is one of those who hold the view that the mosquito does not always explain the prevalence of malaria.

Serre (La Réunion) is infected with malaria, and an anopheles has never been discovered.

There are two neighboring places in Tonquin connected by a railway, in one of which malaria is rampant while it is unknown in the other, although the condition in respect to mosquitoes is identical. At Hatou (Tonquin) men dwelling near a pool infected with mosquitoes never catch fever, whereas those working some distance away on earth works are ravaged thereby.

Along our bayous (streams, rivers, in

other States and countries) where the mosquito is plentiful there is no fever in the fall season, but malaria is found in the plowed lands.

Dr. J. H. Salisbury, Professor of Physiology, Histology and Pathology in the Charity Hospital Medical College of Cleveland, Ohio, claims to have ascertained that these fevers are caused by the introduction into the system of cells, or spores, emanating from certain species of algæ called Palmellæ. The so-called ague-plants were invariably found in numerous localities in which intermittent fever prevailed, and in no instance were they found where this disease did not occur. Flakes of the surface soil from a malarious locality which were covered with the palmellæ were carried to a high hilly district, situated five miles from any malarious locality, where a case of ague had never been known to occur. These flakes were exposed on the sill of an open second-story window of the sleeping apartment of two young men. A plate of glass suspended over them during the night was found to be covered with palmelloid spores and cells. Both young men had intermittent fever, one on the twelfth day and the other on the fourteenth day, no other members of the family becoming infected.

These spores were found in the urine of persons affected with intermittent fever (Flint's Principles and Practice of Medicine, edition 1868, page 869). I am convinced that the old theory of the etiology of malaria, based on many years' observation, ought not to be contemptuously rejected. We need only to tack on the theory of the transmission of the disease by the mosquito from the sick to the hale, and in this way we shall be sure of knowing the various modes of propagation.

J. P. Francez, M.D.

Carencro, La., Nov. 22, 1919.

NOTES AND QUERIES.

ENFORCEMENT OF THE HARRISON NARCOTIC ACT.

In the *Boston Medical and Surgical Journal* of November 13, 1919, the attention of physicians is called to a pamphlet entitled "Enforcement of the Harrison Narcotic Law," which has been issued recently by the Commissioner of Internal Revenue. The recent decisions of the Supreme Court of the United States indicate the necessity for exercising the greatest care in carrying out the provisions of the Harrison Narcotic Law as amended by the Revenue Act of 1918. It is important to know that it has been held unlawful for a physician to furnish a drug addict with narcotic drugs for the purpose of satisfying his appetite, and not in the course of regular professional practice of medicine and in the proper treatment of disease; a practitioner who issues an order under these circumstances, as well as the druggist who knowingly fills such an order, is judged to have committed an indictable offense. A physician must personally attend the addict and himself administer the dosage in order to show that he is practicing in good faith.

Physicians will undoubtedly be called upon to meet many cases which it will be difficult to solve in strict accordance with the Harrison Narcotic Act, for it is not to be expected that rules can be formulated to cover every specific case. In view of this fact, a number of suggestions have been set forth in this pamphlet which may be found of great practical value. In extraordinary cases which cannot be decided by the collector, a full and accurate statement of the facts should be submitted to the Bureau at once. In many cases involving the treatment of incurable diseases, aged and infirm addicts, and the ordinary addict, the following suggestions, which are subject to modification through further interpretation of the courts, may be helpful.

In the treatment of persons suffering from a proven incurable disease, such as cancer and advanced tuberculosis, it is

deemed justifiable for the reputable physician, strictly for legitimate medical purposes, to prescribe narcotic drugs for the immediate need of these patients, provided he personally attends such patients. The prescription in these cases should be endorsed by the attending physician to the effect that the drug is to be dispensed to his patient in the treatment of an incurable disease. The treatment of these persons should be conducted cautiously and not too much credence given to the statements of the addict, as an unscrupulous person will often try to impose upon the physician in order to secure drugs to satisfy his cravings. As no fixed rule can be laid down for the treatment of incurable diseases, the responsibility rests with the physician primarily, and also with the druggist who fills the prescription.

There are cases where aged and infirm persons who have been addicted to the use of drugs for many years may require a minimum amount of narcotic in order to sustain life. Prescriptions written to satisfy the needs of these patients may be filled without criminal violation of the law. The prescription in this case should be endorsed by the physician and the statement made that the patient is aged and infirm, and that the drug is needed to sustain life.

The chief difficulty in carrying out the Harrison Narcotic Act will be met in the case of the ordinary addict who is neither aged nor infirm nor suffering from an incurable disease. It should be borne in mind that mere addiction alone is not recognized as an incurable disease. It is a violation of the law for practitioners to furnish an addict with narcotics for the mere purpose of satisfying his cravings for the drug. There is being considered a project by which the United States Public Health Service will assist in the institutional care of these addicts, but there has as yet been no specific appropriation made by Congress for this purpose. It is thought that it would not be difficult under the management of a reputable physician appointed by the local authorities, to examine, register, and give regular treatment to these ordinary addicts by reducing the dosage to a minimum and encourag.ng the addict to enter a hospital, sanitarium, or institution for further treatment and cure. It is the opinion of the Bureau that the so-called reductive ambulatory treatment, where narcotics are furnished to an addict who controls the dosage himself, will not benefit or cure the patient and will often lead to illicit traffic. All peddlers, smugglers, manufacturers, wholesalers, retailers, practitioners, and other persons who wilfully violate the intent and provisions of this law will be prosecuted by the officers of the Bureau in order to eliminate this menace.